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Guest Editorial

POSTPONEMENT, NOT EXEMPTION

THE executive order issued by President Truman March 31 authorizing deferment of students has been criticized severely in editorials in many of the country's leading newspapers. Columnists, too, have attacked the regulations most vehemently. For example, Robert C. Ruark, in his widely syndicated column, closes his comments with the statement, "This block deferment of students and smart guys is an insult to every cross at Anzio, and to every civilian who presently wears the uniform of his country." As Ruark presents it to his readers, we will draft the Al Smiths and exempt the Alger Hisses. Obviously such intemperate words will arouse public indignation against student deferment and indicates an unwillingness to discuss the question objectively.

The *Boston Traveler* in an editorial entitled "Buying Substitutes" likens the new regulations to "the cowardly, disgraceful Civil War system of buying substitutes for the battlefield." Even Hanson W. Baldwin, military writer for the *New York Times* and noted for his objectiveness, condemns the executive order, although he does admit that a serious shortage of scientists, engineers, and technically trained personnel exists now partially as a result of mistaken draft policies in World War II. Mr. Baldwin is critical of the new regulations but fails to offer any alternative method of selection.

MIT President J. R. Killian, Jr., addressing the recent Boston session of the 119th meeting of the American Chemical Society, refuted the baseless charge that the new regulations create an "elite" group or a "silk stocking aristocracy." "It is important," he said, "to understand that the new executive order will defer, but not exempt students from military service. Let me emphasize that men so deferred will still be liable for military service upon completion of their college work. Editorial reaction to the announcement of the program makes it clear that this is not well understood, and student deferment is being criticized on the basis of this misunderstanding."

In Dr. Killian's opinion, the new executive order is a transition measure primarily to deal with students already in college and, in his judgment, it has meaning in the long run only if considered in relation to the universal service legislation now before Congress.

Arthur S. Flemming, president of Ohio Wesleyan and chairman of the Manpower Policy Committee of the Office of Defense Mobilization, also has defended the soundness of the new regulations and insists that its critics are making statements not consistent with the facts. He characterizes the regulations as providing temporary postponement of military service for certain college students. Dr. Flemming's favorable viewpoint toward the new regulations is not shared by Drs. Conant and Dodd of Harvard and Princeton, respectively, and both in sharply worded comments opposed the Truman-Hershey directive.

The savage attacks made on the new regulations are unfortunate, for they are creating prejudices in the minds of the public and will, we fear, preclude a sound analysis of the situation and a calm approach to a solution.

We may well be in the present state of international uncertainty for years. We are desperately short of scientific and technological manpower. To deplete the colleges and universities of the present enrollment, particularly in these two fields, will jeopardize our continued leadership in science and industry over the next decade or two. It is a terrible price to pay for the unbridled prejudices that have now been aroused.

There are so many facets, it is impossible to discuss them all. Reading the editorials and the comments of columnists and even educators, one would be led to believe that only the rich man's son goes to college. This may have been true many, many years ago, but certainly it is a misrepresentation of present conditions. There are some very plain facts that somehow must be brought to the American public in a dramatic way. If World War III becomes a reality and atom bombs and guided missiles are used, then the most potentially dangerous spot to be in is a highly industrialized urban center. In this kind of warfare there is no aristocracy. There seems to be an almost childish belief that the donning of a military uniform automatically places the wearer in a position of imminent danger. A relatively small percentage of the total in military uniform serves in the front lines and in foxholes. If we are to be consistently democratic, then we should insist that every individual in uniform be rotated so that he serves in the front lines. This may be totally democratic—it is not an effective way to win a war. The military itself practices deferment. How else can you explain the continuance of training at West Point and Annapolis? How else can you explain ROTC and other forms of deferment sponsored by the army, air force, and navy? Is there any particular difference between deferring an individual in order to train him as a scientist or technologist and deferring him for military duty? In both cases you are training individuals so that they can best serve according to capacities. Finally, we think it significant to point out that there is a real element of potential danger in making atom bombs, guided missiles, explosives, poison gases, and the like. Such plants hardly are havens for those who would run from physical danger.

Personally we feel that the new regulations may be too broad and therefore there is some element of justification for tempered criticism. The regulations can be altered once the principle behind them is accepted. Our chief criticism is that the elements of policy-making and administration of the draft still remain in the hands of Selective Service. We believe sound policy would insist that these two responsibilities be placed in separate hands. The most satisfactory way of accomplishing this that has been evolved to date is a national scientific personnel board which is recommended in the report of the NSRB Scientific Manpower Advisory Committee headed by C. A. Thomas, chairman of the ACS Board of Directors. We are in a horrible state of confusion. We must accept a practical plan based on sound reasoning; blind emotions can lead us only to disaster.

—WALTER J. MURPHY
Editor, Chemical & Engineering News.

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MANPOWER AND DEFERMENT

NEW DEFERMENT POLICY

College student deferment has become the subject of lively public controversy. It will be decided by two developments: 1) *Regulations* for deferment, issued by selective service director, Major General Lewis B. Hershey; and 2) *Legislation* extending the present Selective Service Act.

Deferment by Academic Standing.—The new regulations, issued on March 31, (unless confirmed, they will expire with the end of the present Selective Service Act on July 9, 1951) provide for the deferment of college students on the basis of high academic standing *or* good performance on an examination to be given to all draft-eligible students. The plan follows, to a large extent, the recommendations of the "Trytten Report."[1] High school graduates acceptable to any accredited college as freshmen would be deferred for a year. Freshmen would be deferred to enter the sophomore class, if they were in the upper half of the freshman class; sophomores would be deferred to enter the junior class if they belonged to the upper two-thirds of their class, and juniors would be deferred for the senior year if in the upper three-quarters of their class. In certain fields of graduate study, in which the student's "activity in study may be considered to be necessary to the national health, safety, or interest," any student accepted by a graduate school would be deferred. In other areas of graduate study, only students who had been in the upper 50 per cent of their senior class in college would be deferred. (All students already in graduate school would be deferred until termination of graduate study, provided continuous satisfactory scholastic performance.)

Deferment by Test.—The new deferment plan differs from the Trytten proposal in that adequate performance on the Selective Service Qualification Test will be sufficient for deferment independent of the scholastic standing. Officials of the Educational Testing Service (ETS) of Princeton, New Jersey, who are in charge of administering the test, indicated that the deferment score of 70 is equivalent to a score of about 120 on the Army General Classification Test. (About one-sixth of the men tested in World War II achieved this score.) Seniors who get a score of 75 will be permitted to enter graduate school. The tests, which will only be given to students already enrolled in colleges, will tend to correct the discrimination against students from institutions whose entrance requirements are more stringent, which would arise if class standing alone were used as deferment standard. The three-hour test will consist of the following four parts: 1) reading comprehension; 2) verbal relations; 3) interpretation of data (including charts, graphs, and statistics); and 4) mathematics aptitude.

How Many Deferments?—The present male college population is estimated at about 1,580,000 by ETS president Henry Chauncey. However, there are many of these who would not be influenced by deferment regulations. There are 160,000 graduate students (who are all subject to deferment), 361,000 part-time students (who are not eligible for the test), 423,000 veterans, and about 201,000 members of the Reserve Officers Training Corps. This leaves 435,000 students who may seek deferment either by test or by academic standing. If one accepts this figure and the data given above, about 320,000 students will be deferred. General Hershey has indicated that the cut-off point—at which students are to be deferred—is adjustable.

It was originally assumed that this plan would be binding on the local draft boards. For example, the *New York Times'* education writer, Benjamin Fine, said on April 8 that if a local draft board could not meet its quota with non-college men, it would have simply to let it go unfilled. However, in commenting on the Kilday amendment to the House version of the draft bill, General Hershey said, "the amendment merely recognizes a state of affairs that already has existed—that the ultimate decision as to whether a man should or should not be drafted rests with his local board." This statement was made on April 15, two weeks *after* the announcement of the deferment plan. Unless present draft boards are quite different from those of World War II, some of them, at least, will probably refuse to be guided by the deferment regulations.

Opposition to the Plan.—All opponents of this proposed student deferment system denounced it as undemocratic. However, these opponents came from many different groups and have quite different alternative suggestions. The most common (and dangerous) opposition is that expressed by the question: "Why should an intellectual

[1] See *Bulletin*, VI (December 1950), 376–78.

H. H. GOLDSMITH AWARD

In the August–September 1949 issue of the *Bulletin*, the editors announced a plan to establish an annual award in recognition of the best contribution in the field of science and its relation to public affairs to be known as the Hyman H. Goldsmith Memorial Award.

It is now planned that the first award of $200 will be made on October 1. The award will be given either for an article published in America or elsewhere during the year ending July 1, 1951, in any journal or newspaper except the *Bulletin of the Atomic Scientists* or to an article submitted for this purpose to the *Bulletin* before July 1, 1951, and not published elsewhere. The jury will be selected from prominent persons not on the Board of Directors of the *Bulletin*.

Nominations for the award in the form of either published or unpublished articles are invited from our readers and friends.

aristocracy sit at home, evading military service, while other young Americans risk their lives on the battlefield?" To this, proponents of the plan answer by pointing to the need of the nation for trained scientists and technicians, and generally well-educated men. They cite the present shortage of scientists and engineers as evidence of the damage inflicted on the educational system by the shortsighted manpower policy of World War II. Finally, they point out that *deferment* of military service does not mean exemption from service, but merely postponement of the service years until the college-trained specialist will be able to serve in a capacity requiring his special training.[2]

However, there is also opposition from some who concede the latter point. Hanson Baldwin, military analyst of the *New York Times*, suggested that character and leadership qualifications should be added to the purely academic criteria in selecting men for deferment. Charles Ralls, commander-in-chief of the Veterans of Foreign Wars, objected to setting up a group "entitled to special privileges because their parents are sufficiently wealthy to provide them with a college education." VFW believes that all eligible men should be drafted and that after they are inducted into the armed forces, those with proper qualifications should be chosen for college training at the nation's expense.

Leaders in education, who are fully aware of the need for college-trained men, also were divided on this plan. Both Dr. James B. Conant, president of Harvard and Dr. Harold W. Dodds, president of Princeton, called for the Universal Military Training program, which alone can make a deferment plan of the contemplated type fair and democratic. Dr. Griswold, president of Yale, also indicated his preference for UMT, but went on to defend the proposed plan in the following statement: "I do not consider the present policy so unreasonable and unjust as do some of its critics. Deferment does not mean exemption. It is at least conceivable that by continuing their studies our undergraduates could make themselves more useful to the armed forces than by cluttering up already congested army camps and facilities. I still hope that Congress will adopt Universal Military Training and Service. But I hope even more that we shall not lose our heads and throw higher education to the winds in deference to the very anti-intellectualism we now fear."

[2] See page 130 of this issue.

One strong objection to the plan, which carries considerable moral weight, is that many young men of adequate intelligence are financially unable to attend college. If college training is so important to the defense effort, the argument goes, government should provide funds to train the promising candidates. Benjamin Fine reported in the *New York Times* that the Committee on Relationships of Higher Education to the Federal Government will probably press for such a national scholarship program.

Two other arguments against the deferment plan carry less conviction. Concern over the manpower limitation resulting from liberal deferment policy seems unnecessary, since the 320,000 students who may be deferred make less than 10 per cent of manpower needed by the armed services; furthermore, the number of deferments can be reduced, if need should arise, by General Hershey. Some critics were concerned about the armed forces being deprived of individuals of higher than average mental capacities; they now seem to feel, however, that the ROTC programs can be, if necessary, expanded to cover the needs of the armed forces for leadership.

NEW LEGISLATION

The Senate Bill, S.1,—"An Act . . . to permit the more effective utilization of manpower resources of the United States by authorizing universal military training and service . . ."—was passed by the Senate in the middle of March. The much amended House version of this bill was passed on Friday, April 13, and a House-Senate conference committee is attempting to work out the differences. The main issues in S.1 are these:

Universal Military Training.—The administration had proposed a permanent UMT program under which all able-bodied men would be given basic training. In time of emergency they would join the armed forces following this training; otherwise they would be kept in the reserve for eight years. The Senate bill as passed, contained a stand-by UMT provision, to be put into effect at the President's discretion —presumably when the armed forces no longer needed men below nineteen for actual service. An attempt to kill UMT outright was defeated by a vote of 232 to 140 in the House, but the House bill, as passed, would require additional congressional action before the UMT provision could be put into operation.

Age of Induction.—The administration had requested a lowering of the induction age from the present 19 years to 18 years. The Senate approved this recommendation but stipulated that all older eligibles had to be drafted before the 18-year-olds were called. The House agreed with the Senate, but set the age limit at 18½ years.

College Deferments.—Under present law, the President has broad authority to defer the induction of college students. General Hershey's new regulations, described above, were based on this authority. In the new bill, as part of UMT, the administration asked Congress to specify that up to 75,000 high school graduates would be allowed each year to go to college after brief basic military training. The Senate approved this proposal. However, following the announcement of General Hershey's wider deferment plan, the House passed the Kilgore amendment which affirmed the right of local draft boards to decide on deferments, regardless of Presidential direction. The House-Senate Committee thereupon agreed on the House version, and dropped the 75,000 minimum figure for college deferment.

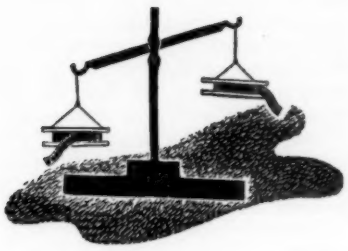
The House bill provides for a three-year extension of the draft and a twenty-six-month term of service for draftees. The Senate bill extended the draft indefinitely and limited the term of service to twenty-four months.

In view of the strong and contradictory feelings of the two sides on the UMT portion of the draft bill, observers have predicted that the new draft legislation will not be enacted until immediately before the expiration date of the present law, July 9. The Senate-House Committee has postponed further discussion of a compromise bill for several weeks, until after the foreign and military policy investigation precipitated by the dismissal of General MacArthur.

—PETER AXEL

THE CONSEQUENCES OF KOREA

REXFORD G. TUGWELL



Dr. Rexford G. Tugwell, professor of political science and director of the Program of Education and Research in Planning at the University of Chicago, analyzes how the events in Korea have affected the hope that negotiations may yet prevent general war.

THE decision to resist aggression in Korea had to be taken so suddenly that adjustment to its implications had all to come after the event. This was not because the decision itself was illogical, considering all that had gone before, but because Americans had not until that moment faced the probable consequences of the policies to which they had given assent. So that when the necessity for action presented itself, they squirmed uneasily and looked around, too late, for alternatives.

They looked also, it is rather sad to say, for an author of their ills—a scapegoat—and found him in the person of Secretary Acheson. That official, for a long time, had few defenders even among those whose policies he had merely enforced, and the diversion allowed those who ought to have been thinking about the national interest to bay noisily on the trail of irrelevant personalities and issues.

It would not be true to say that the clear necessity for resistance went unrecognized. But there were certainly many who did not like what they had got into. There was a widespread feeling that somehow the diplomats ought to have prevented outright conflict. And on the basis of this feeling there ensued one of those utterly confused debates which democracies periodically find necessary while minds are being cleared. The debate was not always to the point. There were political opportunists who took advantage of the confusion; there were some exhibitions of untimely emotion; and there were also those who now said that the outbreak was the result of policies from which they had all along dissented; but gradually it was accepted that the explosion in the Far East was a strictly expected one if Soviet expansion was to be resisted, and that probably there would be others of a similar sort. Attention gradually focused on an estimate of relative potentialities, where, from the first, it should have centered.

THE POLICY OF CONTAINMENT

Without noticeable dissent, the United States had set out in 1945–46 to contain Soviet imperialism; and containment involved stopping expansion. This was the one firm tenet of our foreign policy. The choice of instruments for such an undertaking is determined by the force behind the expansion it is expected to contain, and by the means used by the challenging power as well as by the available resources immediately at hand.

The incidents of containment will occur whenever and wherever the challenger judges that he possesses the ability to overcome resistance. It had been thought that there were more likely spots than Korea for the first of such incidents—Yugoslavia, for instance, or Iran. But that the expanding power had found a weak spot turned out to be a fact: the United States suffered there one of the most humiliating military defeats in all history. But also, as was gradually realized, the place for the incident was at a suitable remove from European Russia so that the fiction of non-involvement could be quite complete and quite without penalty. Procedure by proxy in the Korean affair is certainly one of its most conspicuous—and maddening—characteristics. So perhaps it was the most likely spot after all; and the American judgment of its suitability was at fault.

Americans were surprised, it can now be seen, because they had not understood what the Soviet answer to containment would be. Only the hopelessly innocent could have believed that Soviet intentions did not involve world hegemony, proceeding outward from her borders. But there were others, not innocent at all, who trusted too much in what they believed to be Russia's own self-interest. This, they thought, would require consolidation of the enormous gains of recent years before further expansion was risked; they also judged that the means used would be propaganda rather than force. Their views turned out to be miscalculated.

The official American view, as can be seen now, was sufficiently realistic, but it involved actions for which a suitable preparation had not been made either in military strength or in public opinion. So that many months after the Korean decision, after the commitment of ground, air, and naval forces, there was still a dangerous doubt concerning its necessity. And even in realistic minds there was a question whether the Korean incident had furthered or had hindered the policy of commitment. It was still being asked whether the first defense of principle ought not to have been made elsewhere.

WESTERN MILITARY WEAKNESS

Even while the debate concerning Korean involvement was at its height, the administration was forced to undertake the task of preparing for other incidents. The consequence of accepting battle in one situation was that thereafter there could be no compromise in any similar situation. Intense efforts to repair old mistakes were undertaken, but they had to be under-

A part of this article was presented by Dr. Tugwell on April 12 at the Conference on World Affairs, University of Colorado, Boulder, Colorado.

taken in confusion and with haste. For it was not instantly clear what kind of rearmament was necessary for such situations. The lessons had to be learned before there could be any profit from them, so that the felt urgency was unable to emerge into effective action for some time; and since appropriation had to precede procurement, and retooling had to precede production, new arms were frighteningly slow to come.

One thing was instantly clear: a power vacuum existed all along the borders of the Soviet imperium; and it was a vacuum which threatened the existence of Western civilization. Russian power, without opposition, had already been allowed to overflow into the heart of Asia and to advance in Europe to the Elbe, but that by no means exhausted the threatened area. It had evidently been conceived here that Communist regimes in East Europe and China were not the agents of imperial Russia but only of a Communist international. And recovery from that illusion was slow. This *must* have been the prevalent illusion. Else why was so complete a demobilization of the once-vast American force carried out? When Soviet intentions were finally assessed, the existing American strength was utterly unable to support the policy necessary to successful opposition. There were humiliations in Korea; but there was also the greater one of realizing that the national military weakness had presented the Soviets with a prestige completely out of proportion to basic national strength. They could not be talked to as equals. They were, and were acting as if they were, the superior power.

There was more reason in this than was understood as, in 1950, their appalling weakness was gradually borne in on Westerners. For there had been a very prevalent theory, which had died hard, that the old kind of war had disappeared into limbo. We had thought we were strong for a new kind of warfare. That was the result of the last incident of World War II—Hiroshima.

The application of force in settling human disputes seemed to have reached the final end of absolute devastation. The possession of that force and the ability to direct it at will were thought to have superseded all the means hitherto resorted to in the imposition of one view as against another in international conflict. This weapon belonged to the United States. And it had seemed unthinkable that there could be a challenge which would risk its use. It had therefore been counted on to temper and hold in check Soviet ambitions even though they might be as aggressive as the worst pessimist feared and might be supported by vast ground armies. And, of course, if this was so, what use could there be for a vast military establishment of the conventional sort? The general acceptance of this view was what had made demobilization seem reasonable, and recovery from it was reluctant and slow.

There was another thing. It was impossible for Americans to realize that any other people could question their good intentions. They were so centered in self-development, and beyond that, in willingness to extend a practical neighborliness to all who were

less fortunate, that it was with incredulous amazement that they listened to the first measures of a Soviet hymn of hate. As that symphony went on to one climactic movement after another they were moved first to an annoyed amusement, then to indignation, and only finally and late to any calculation of its possible results.

But there were two successive shocks which shook even the most complacent Westerners. There was first the rejection by the Soviets, for themselves and for their satellites, of participation in the Marshall Plan. Then there was the refusal of the Soviets to accept atomic disarmament, offered, as Americans felt, in all good faith. These were evidences that America was undoubtedly regarded in the Communist realm as a kind of monster seeking to devour the world. But since no American could find in himself or his neighbors any of the characteristics or motives attributed to him in those incredible speeches of Molotov or Vishinsky when discussions were going on, he was thrown back on an incredulity whose chief manifestation was isolationism. If his help and his peace gestures were to be thus summarily rejected, let those silly people stew in their own juice. There was plenty to do at home while we sat securely and distantly behind the overwhelming power of the bomb.

IMPEDIMENTS TO NEGOTIATIONS

This isolationism was first seen to be impossible when it was announced that the enemy also possessed the atomic weapon; and the final impossibility of peace and security behind this shelter was realized when South Korea was invaded and the aggression had to be met in the old manner with guns, armor, and foot soldiers. During most of the postwar period before Korea there had been no real negotiations between the power groups centered in Moscow and Washington.

Both sides, as could be seen in looking back, tended to become immobilized by their conception of themselves and of their opponent. Both were governed by illusions. Americans came to believe that the Russians intended to reduce the capitalist strongholds by propaganda and infiltration, neither of which were greatly feared; and the Russians believed that the West intended presently to invade their territory and destroy the centers of communism. The struggle ceased to be one for the bordering areas between the two power centers and came dangerously close to an accepted war for survival in which the only tolerable end would be the destruction of one or the other.

If negotiation had been possible, even at a late stage, the West would undoubtedly have been quite willing to settle for coexistence with some guarantees against further aggression. There were indications that the Soviets were not far from the same conception, although it was not expressly stated. But it was not only the inability of diplomats to implement this mutual unwillingness which paralyzed negotiations, nor even the mutual illusions they harbored. It was the existence of the genocidal power which each knew the other to possess. How could negotiations take place in the presence of the atomic bomb? Obviously only if each could be convinced that the other would somehow be restrained from its use and that conventional conflict, if resorted to, would result in stalemate. And neither could see any way to such a mutual arrangement, for the mere possession of fissionable material, together with the engineering ability and an industrial system, constituted all but the final step toward possession of lethal weapons. And fissionable material was evidently basic to new industrial advances to which both were committed. Neither was willing to go back to pre-atomic industrialism.

What this means can best be understood by imagining for a moment that in 1951 the atomic weapon did not exist. If it had not existed, and the

United States had demobilized in 1945–46, Russia would now be potentially the master of all Europe, probably all Asia, and of the Middle East. This situation of preponderant strength would be the background against which international arrangements would be made. The West would have lost the struggle against Soviet imperialism. Western rearmament would not be allowed on penalty of Soviet occupation clear across Europe to the English Channel. But the atomic weapon did exist; and it was, until 1950, an evidently effective substitute for the armament sacrificed in demobilization. Behind it, and with the help of Marshall aid, the West did regain much of the strength dissipated in demobilization. But when it was known that the monopoly of atomic weapons had been broken, the whole background of diplomacy was fundamentally changed, official pronouncements to the contrary notwithstanding. It was not Korea, then, which changed the terms of the struggle; it was the Soviet possession of the atomic weapon.

But it did require Korea to demonstrate that the struggle had now emerged in new terms. The Soviets had either to be matched with conventional armament, backed with industrial strength, or the chance had to be taken that an atomic attack—preventive war—would succeed. This last was an almost intolerable risk for the highly integrated economies of the West. A certain number—which no one would specify—of A-bombs could pretty well disrupt the functioning of the industrial centers in Western Europe and the United States. But although the Russian economy was not so highly integrated, it was still sufficiently so to be vulnerable to mass atomic attack as well. The production of heavy goods, which is the basis of armament, is necessarily carried on in large units; and progress in aviation had been such that intercontinental bombers could deliver a paralyzing blow if enough of them were used to carry many A-bombs to marked targets, and if they could get through to those targets.

THE QUESTION OF RELATIVE STRENGTH

The risks were roughly equal, then, so long as the West possessed a larger stockpile of bombs, and so long as the Russian stockpile was not large enough to paralyze Western production in one initial blow. The Soviets were preponderant in land power; but it was neutralized by American possession of the A-bomb. It was judged by most rational calculators—and evidently this was the judgment of American officials—that power of both kinds could not be equalized for several years—not more than three. At that time, the Soviets would still be behind in stockpiling bombs but would have reached the point at which comparisons of strength were useless, since either could deliver an initial devastating attack; but by then the West would be able to match Soviet strength in conventional armament, at least to the point of enforcing containment. There was question whether an adequate defense or warning system could prevent targets from being reached or could give time for an answering attack to become airborne. And this question remained unanswered throughout the 1950–51 debate concerning policy. It was, of course, crucial if it could have an answer; but there are often crucial questions which cannot be answered when the answers are wanted; and this was one of them. It had to be assumed, therefore, by those concerned with policy, that bombing attacks *could* be delivered, and could *not* be prevented by either side.

It was considered by Western policy-makers that the atomic risks would be greater for the Soviets during a certain period, and that this period must be utilized to re-establish a position of equality in conventional armaments. There were those who questioned this. It was, for instance, not accepted by many tired Europeans, whose land had been so often fought over and whose people had made so many sacrifices. They put it this way: the Soviets now have the strength to overrun Europe if they desire. Against 175 divisions (thirty of them armored) the West could oppose no more than 12 divisions (four of them armored). To re-establish effective potential non-atomic opposition would require at least three years. If the Soviets meant to attack, they would do so before the West was ready. If they had no hostile intentions—that is, if they did not mean to resort to outright force—rearmament was not necessary and would only hinder the recovery so well begun with Marshall Plan aid.

This was not an argument which was easy to answer, because the answer depended on the calculation of an equation in which the unknowns were crucial. That calculation was that a preponderance of atomic strength would actually lie with the West for the time necessary to build up conventional force. The several elements of the calculation which were not known and which were not certain were, for instance, the emergence of new types of armament, not hitherto used, which would make defense against land attack more effective; the faster and more maneuverable tactical planes, of which much was heard; and progress in the development of guided missiles. There was even talk of "atomic artillery"—supposed to have been tested at Las Vegas during the winter. But everyone who heard the rumor realized at once that this would be a dangerous resort. For the terms of the struggle might very likely turn on tacit agreement not to resort to atomic bombing, and atomic artillery and atomic bombs dropped from planes were perilously similar. Their use might abruptly end any such hidden truce. But there might be other weapons able to oppose successfully the armor which had been the irresistible force of World War II. It was generally thought—or hoped—that something of the sort existed and was a Western monopoly. Otherwise, the possibility of meeting the Soviet hordes on European battlefields seemed a very great risk indeed. But when these improvements were not secret, they were still untried. And their strategic importance could not be debated with any realism.

THE DEBATE ON FOREIGN POLICY

This characteristic of the debate of 1950–51—that is, the conjectural element—made it in many ways unreal. Some of the unknowns in the calculations supporting American policy may have been known to the military; but the public had no information. Democracy was not able to function by factual discussion. Nevertheless, it was pursued with emotion and energy. If it generated more heat than light, it was still a debate in the great tradition. Democracy operated as well as it could, even if a good deal in the dark. The debate resulted, however crippled from lack of fact, in what seemed to be majority acceptance of the necessary risk. It was hoped that the risk was more calculated than emotional. But that was far from certain. Perhaps the conclusion was reached from lack of alternative. Perhaps the West, unwilling to resort at once to preventive atomic war, had to make the effort, or else, within a few years, face something like surrender.

It had been the contention of Secretary Acheson all along—and this be-

came official policy—that Russia could be negotiated with only in a situation of equated strength. Of course, the Soviets had refused to recognize the strength represented by atomic monopoly when the United States had possessed it; but that may have been based on confidence in peaceable intentions which they professed, for propaganda purposes, not to believe in. They could no longer calculate on it. The acerbations of the past four years had brought Westerners to a belligerence in great contrast to their immediate postwar mood. The Soviets had made true one of their propaganda claims, at least. It would, by Spring of 1951, take a great deal of conciliation to stop the progress of the West toward coming to a showdown. And the Soviets were still not willing to conciliate and not ready to acknowledge the existence in the West of sufficient power to check their ambitions.

There was curiously little talk about what a showdown might be like if it came before rather than after war. The President and his official entourage still insisted strenuously that they aimed at preventing war. They must therefore look forward to a time when the Soviets would, because of the implied penalty in not doing it, engage in negotiations.

Bargaining is the business of diplomats. It is the central focus of foreign policy. Ranged behind the negotiators is the mustered strength of their nations, and it is the expectation that they will make that strength count for all it is worth. Assuming that both sides in the contemporary struggle had competent diplomats, then, negotiations ought theoretically to yield arrangements in conformance with national achievement.

Concerning the negotiations which must take place at some time and place if war was not to be resorted to, there would, in a democracy, have to be debate either before or after. And, at the very least, those who were to negotiate ought not to be inhibited by uncertain reception at home of any arrangements they might arrive at. That there would be grave danger of this sort, if negotiations should come any time soon, was obvious. For no preparation had even been suggested; and no discussion had been begun.

This might be because everyone had been busy debating the calculated risk of challenging the Soviets and because the administration had been so fully engaged in getting its own way about rearming. At any rate, as preparations had to be made for a forthcoming Four-Power conference in the Spring of 1951, Western negotiators had no instructions from their electorates. They were therefore in the unhappy position of being unable, in any real sense, to negotiate at all. This led to natural claims, especially among those in Europe who were suspicious of American intentions, that negotiations were not really wanted.

It may have been that so early a meeting was felt by policy-makers to be merely premature. But certainly, the reluctance to confer on the part of the Americans was marked. If this was so, it must have come from strict adherence to the conception that a situation had not yet been reached in which the conditions were favorable. Those conditions, as has been noted, were partly open and known; but partly were undisclosed. The open and known condition was, as Secretary Acheson had stated it: that the West ought first to reach an equating of its power with that of the Soviets. Negotiation, it was said, would be fatally handicapped so long as the Western diplomats spoke from relative weakness. But the undisclosed condition was the confidence evidently felt by Western planners that a time would come when Russian power would be matched or surpassed. The calculated risk was, for this purpose, regarded as a certainty.

But how important that calculation was could be seen by the struggle the administration was having in Congress and with disaffected interests to gain a free hand in the building up and deployment of conventional American strength. There was evident a lack of general confidence, in spite of belligerence, that the Soviets could successfully be opposed in Europe. And if this could not be done, the matching of strength could not take place. For the conquest of Europe would double the Soviets' industrial potential and more than double their strategic power. The loss of Western Europe would throw America back into a secondary position from which recovery would be just next to impossible. There did, in fact, exist in the public mind an almost intolerable dilemma.

The calculated risk, admitted and not admitted, then was that the West would, during the time given by atomic superiority, be able to meet the Soviet armies east of the European industrial centers with the use of conventional (but perhaps greatly improved) armaments including air and naval power, and that the Soviets, being realistic, would then recognize the impossibility of conquest and come to some arrangement. Our policy-makers seemed to feel that negotiations would be futile in 1951, perhaps also in 1952, but probably possible in 1953.

The uncertainties here, apart from the possibility of new devices and improvements of old ones which would stop armor in its tracks and generally neutralize the Soviets' vast superiority in troops, had to do with the stockpiling of atomic bombs and their possible increase in destructive power. Everyone had been set to guessing about how many bombs we, by now, possessed, and about how many the Soviets possessed. Professor Urey ventured the guess that the Soviets in the Spring of 1951 had as many as fifty. It was shudderingly concluded, by those who read or heard his estimate, that this must very nearly approach that number beyond which it was not necessary to go because it constituted an absolute amount—that is enough if delivered, to paralyze the entire Western industrial complex.

Of course, his, even if an educated guess, was still a guess; and it could only be hoped that our non-compromising negotiators in Paris, had better and more hopeful information. For on the day he spoke (March 22, 1951) the representatives of the United States, Great Britain, France, and Russia were still meeting in the professed attempt to fix an agenda for a later meeting of higher-level negotiators. But if the Soviets still felt stronger than their adversaries or had made a different calculation of the situation to be arrived at later on from that of the Western representatives, there was no prospect of any gain from the conversations. Only if each had made much the same calculation, which seemed to mean an equated probable strength from processes which would go on to their climax, could there be any real negotiations.

WAR OR COEXISTENCE

The prospect seemed to be that the processes set in motion on both sides would go on to their climactic end, whether in war or in a future agreement for coexistence. War, even though the preparations for it were gaining momentum, seemed an impossible conclusion to every informed and sensitive person. For no one could see how civilization could survive the devastation it would cause. This was

a conviction with which policy-makers would have to deal if it should deepen. It was so strong that it had had to be dealt with all along, as a matter of fact, and it was just this factor which may have caused the official encouragement to belligerence which seemed already to have hardened dangerously. For if the horrors of the putative war should be smothered in a developing determination to crush the enemy, it would, even at what might seem the appropriate time, be impossible to halt the momentum and turn to arrangements for coexistence.

It was far past time when the Western public should have been given information and the leadership which would create the necessary flexibility. For it was a mistake to believe that democracies could not progress toward prepared strength and yet remain reasonable enough for the compromise which would avert destruction. But the condition of such a flexibility was the open stating of terms for possible compromise. Only in that way could a democracy become accommodated to the likely conditions. This required really great statesmanship, knowledge of the working of democracy, and inspired leadership. Yet, if war was to be avoided, it seemed essential that democracy should throw up, for its greatest crucial test, such a combination of abilities. It had happened before; it might be hoped that it would happen again. But without question, it was very late for a beginning to be made of a process which must consume a good deal of precious time.

What were the chances that the momentum toward war might thus be checked and turned to the uses of peace? There were at least faint signs that leaders in the West had recognized the deadly danger of intransigency. Ambassador Jessup, only a few days before leaving for the futile preparatory talks in Paris, was moved—perhaps officially requested—to make an eloquent address of warning against "preventive war." Preventive war was, of course, a hold-over term from the time of American atomic monopoly, and inappropriate in 1951. Yet, that there was a significant public urge to undertake immediate hostilities was apparent. It came of impatience, the intolerable pressures of uncertainty, and the suspicion that time ran against the West.

EUROPEAN DOUBTS

Uncertainty had all along been a large element in American opinion. Americans had been far more impressed with the results at Hiroshima and Nagasaki than any other people in the world; and the well-publicized explosions at Bikini, as well as the sinister later mysteries of Eniwetok and Las Vegas had deepened and set the conviction of possible impending horrors. Others who viewed the possibilities more calmly said that American tension came from having so much more to lose, that the shock to fatness and complacency had been more than could be borne with equanimity. They also obviously distrusted the American ability to think calmly under such circumstances. They had indeed, a lively fear—which seemed to be greater than their fear of Russian aggression—that impetuous and unwise decisions would be taken. They thought, indeed, that such decisions already had been taken in the Far East.

Their reaction—French and British—to the North Korean's attack would quite possibly have stopped short of armed intervention; and their small contribution to that effort had been a measure of their support for it. But they reacted adversely, especially to the neutralization of Formosa, pointing to Mr. Lippman's logical analysis, which said plainly that the only justification of such an action must be found in an intention to use that island as a staging base for an invasion of China. Involvement in a continental war in Asia they regarded as a commitment which would preclude adequate attention to European defense, and they bitterly opposed such an alternative.

They were also afraid that American impetuosity might involve the use of the atomic bomb, either at General MacArthur's direction in ending his "intolerable invulnerability" to repeated attacks from the Manchurian "sanctuary," or, in some fit of annoyance, against the Soviets themselves. For no one in America had the slightest remaining doubt that the North Koreans and the Chinese were Soviet puppets; and there was strong sentiment for ending the masquerade which allowed the Soviet Union to send one after another of her satellites into the conflict while maintaining a sanctimonious neutrality herself. But the use of the bomb, Europeans were clear, would at once precipitate a global conflict in which they would be the first targets.

There thus developed a serious division among the Western allies. It was responsible first for a hurried visit of protest from Clement Attlee and then from other heads of state. These were precipitated by a mistaken interpretation of a Presidential statement; but the real cause was the emotional and intemperate debate proceeding in every available forum, including the Congress. For those who had an interest in supporting intervention in China —and they were curiously and unaccountably influential—had somehow made a marriage with the always latent isolationists in the United States. And isolationism suddenly blossomed out as an active movement for preventive war. This was inexplicable on any other theory than that isolationism had all along—that is, in the period leading up to and during World War II—been reactionary. That is, those who advocated non-intervention in the struggle against fascism and naziism were really sympathetic to those doctrines. They would rather have seen Hitler and Mussolini succeed, for instance, than the British, French, or German socialists. But, naturally, that was not their attitude toward Russians who were Communists, even though their state was a dictatorship. Every instinct they possessed demanded an end to the spread of that philosophy. And it could not be killed off without scotching its source in Moscow. To them a number of well-placed atomic bombs seemed ideally suited to the end they had in mind.

It was the fear that this vocal and, as the Europeans feared, majority opinion in the United States was prevailing, and that they might be catapulted into an atomic conflict as the result of a unilateral decision taken in Washington, which brought the heads of Western governments hurrying to the White House. They were evidently reassured, at least to an extent. But

there were lingering doubts. Europeans always have great difficulty in distinguishing between the most vociferous and the most fundamental American opinion. They have trouble understanding that a great to-do issuing from a reactionary minority with great influence on organs of mass communications may be proportionate to a reluctance on the part of most Americans to accept the point of view so spectacularly being touted. They would understand it at home. They give their own people, however, credit for sense and judgment which they can never quite believe that Americans possess.

The truth was that, behind all the senatorial emotionalism, the editorial threats, and the commentators' exhortations, a solid determination was taking shape. And gradually European leaders came to understand that it could pretty well be depended on, provided the excitable, the self-interested, and the fanatical were not so situated that the people could be committed to more by harassed leaders than they intended. Europeans were still not reconciled to Formosa, still withdrawing about Korea, and still fearful of American intentions in Europe. But the comparative calm of the early Spring of 1951 was in great contrast with the anxieties of the Fall of 1950.

THE IMPLICATIONS OF THE BOMB

Americans were, by the spring, determined to reach, if they could, a situation of strength which would not involve reliance on the atomic bomb. They hoped somehow to neutralize that weapon, although there were still military men and arm-chair strategists who periodically made irresponsible references to its ready availability, and although it was realized that the risks of its possession were still very great—possession both by Russia and the United States. But they had not gone on to a discussion of the accommodations involved in such a neutralization. That was where American leadership, perhaps understandably, yet regrettably, had failed. For the responsible policy-makers were so tormented still by the emotional enemies of communism, who happened to be well-placed both politically and as controllers of mass-communication media, that all their efforts had had to be devoted to shaping and defending a reasoned policy for the first stage of the vast and dangerous game of power politics now being played with the whole world as a field. The second stage had not even been outlined.

The result was that, even though it semed paradoxical, the most intractable element in the whole situation was the quietly shaped and entirely praiseworthy determination of the American people not to be threatened and pushed around by any more dictators of whatever political complexion. They saw very little difference between the new dictatorship they faced and the old ones they had so recently destroyed. Their intentions were simple at bottom, just as they had been simple before—they wanted to end an intolerable menace and then be let alone.

Unfortunately they had not grasped all the implications of the atomic bomb. They did not see that there was never again to be any possibility of the old easy security of continental isolation. Permanent atomic disarmament they still believed to be analogous to the conventional disarmament which had been a fixed reference in American foreign policy for so long. This was a fundamental mistake. They might dis-establish the Politburo as they had dis-established Hitler and Mussolini, but they could never thereafter go on about their business, secure behind protecting seas. The forthcoming negotiations, even if the calculated risks being assumed so gravely came out as it was hoped, would have to deal with issues infinitely more complex than any heretofore imagined. For the bomb would still be attainable by any ambitious industrialized nation which escaped from scrutiny for even a little time.

It would not be an impossible task for democratic leaders to persuade the people that they ought not to interfere with whatever political or economic system exists in Russia or to threaten the security of Russia under any political system. It might not be so easy a task as it might have been before the contemporary fears and rages had bitten so deep; but it was still a very possible one. And the compromises necessary to it, although they ought to be prepared for, would not at all be the sort to which Americans would have fundamental objection.

On the contrary, they would be likely to recognize such compromises as reasonable because they would be necessary to the kind of life they coveted for themselves. But what about this new monster now at large on the earth? How deal with the ability of any reasonably industrialized nation to turn fissionable material, without much danger of discovery, into lethal weapons overnight and so establish a dictatorship of such menacing power that revolt against it would be punished by a holocaust?

THE WORLD GOVERNMENT MOVEMENT

It seemed to those who contemplated the situation calmly that any peace worth having would henceforth have to be based on a system of unexampled vigilance against political renegades of all sorts. This, when projected, amounted to world government. This would be a long jump into the blue for Americans—so long a one, and so unprepared for, that it seemed almost fantastic to suggest it. Yet was there any other solution? If there was, not even its faintest outline had been suggested.

It could not be claimed by its most ardent participants that the movement for world government was a healthy and growing one. In fact, it lanquished in the minds of a few advocates who were strictly excluded from policy-making. Some atomic scientists, who had a more realistic knowledge of the consequences involved in the uses of bombs, continued to warn the public that no other alternative existed. Some social scientists pursued the exploration of such a structure as might be expected to function successfully. A few public men avowed their devotion to the cause. But hardly any one with responsibility for policy even looked in that direction.

Among men of affairs there were only two of prominence and influence whose voices were heard. One of these was the Prime Minister of India, Jawaharlal Nehru; the other was Justice William O. Douglas of the Supreme Court of the United States. But about all either could do was to affirm faith in the ultimate persuasion of mankind to one government for a unified world. During the year, Justice Douglas, in an address to the United World Federalists[1] came close to the exhortation of despair when he cried:

"We who understand the importance of this great task, and who have joined together in this venture, have an obligation to history. Let us return to our homes and carry on the good fight. The road is hard and the obstacles many; but in front of us lies one of the most challenging goals ever set

[1] In October 1950; reprinted in *Common Cause*, IV (January 1951), 281–84.

(*Continued on page 148*)

ATOMIC SPY TRIALS: HERETICAL AFTERTHOUGHTS

EUGENE RABINOWITCH

The three main impressions the atomic spy trial made on public opinion are:

1. The activity of atomic spies has had a tremendous effect on American military position *vis-à-vis* the Soviet Union. Without it, the Soviet Union would not have been in the position—now and for many years to come—to challenge American atomic monopoly and to threaten American cities with atomic bombs.

2. The security measures provided in the past to guard the secrecy of American weapon developments—particularly in the atomic energy field—have been insufficient; more and better secrecy protection is needed.

3. In consideration of the extreme damage inflicted by atomic spies on American security, no penalty was too harsh for them; the death sentence imposed on the Rosenbergs, therefore, was fully deserved.

Following are some heretical thoughts about all three of these points.

I. HOW IMPORTANT WERE ATOMIC SPY ACTIVITIES?

If it were true that our atomic secrets, if kept inviolate, would have provided America with lasting protection, the public belief in the extreme damage inflicted by atomic espionage would be justified; no other man could have demolished these secrets as thoroughly as Klaus Fuchs, the theoretical physicist who has been in the center of the atomic bomb development from its very inception; and Greenglass has provided valuable assistance on a lower technical level. In the minds of many commentators and politicians, there is no doubt that the Russians now have the atomic bomb only because it has been given to them by Fuchs and his fellow conspirators. In assessment of the consequences of the betrayal, the prosecuting attorney in the Rosenbergs' trial went along with the public belief. Judge Kaufman, too, said that never in the past has the life and security of so many been put into jeopardy by so few.

The educational campaign, undertaken by the American scientists since 1945, one of the slogans of which has been "there is no secret of the atomic bomb," did succeed for a while in impressing even those who were at first inclined to believe that to make an atomic bomb, one merely needed access to a "secret formula." The revelation of the spy ring has undone this education. Those who always "knew" that the Soviet scientists could not build an atomic bomb by themselves, but only "steal" it from America, felt themselves vindicated; scientists who had minimized the importance of atomic "secrets," have become suspect of having—willingly or unwillingly—minimized or covered up atomic espionage.

However, the report of the Joint Committee on Atomic Energy[1] takes a more sober view. It estimates that spy activities have advanced the development of atomic weapons by the Soviet Union by "at least eighteen months." We do not know how the authors of the report have arrived at this specific figure; probably nobody can say with certainty whether the speed-up was by one year and a half, rather than by one year or two years. In any case, there is a great difference between a speed-up, even by two years, and the assumption that without May, Fuchs, and Greenglass, the Russians would never have built the bomb. Furthermore, the greater part of the acceleration was probably due, not to revelations of the American methods of producing fissionable materials, or assembling atomic bombs, but to the early and authentic knowledge by Soviet leaders of the wide scope and success of the Allied atomic plans in the years before 1945. This intelligence—assuming it was properly heeded by the Soviet authorities—must have induced them to begin their own large-scale attempts two or three years earlier than they would have done it if our success had remained unknown to them until official relevation in June 1945.

[1] For a summary of this report, see pages 143–48 of this issue.

The Soviet knowledge of the American techniques of bomb production undoubtedly has been valuable in encouraging the Soviet scientists and engineers to move ahead without hesitation and has helped them to avoid certain errors and pitfalls. But one must not forget that the development, from scratch, of the supposedly most important secret of the American project—the mechanisms of the atomic bombs employed in Hiroshima and Nagasaki—was the result of less than a year of intensive work at Los Alamos. According to the Senate testimony of Admiral Parsons, the principles of these mechanisms were clearly established within a very short time after the beginning of this work. Considering that this research was, to a large extent, in internal ballistics, a field in which Russia has had a more extensive experience than the United States and in which it possessed a considerable number of first-class specialists, it is unreasonable to assume that even the necessity of solving these secrets on their own would have delayed the Soviet progress, if at all, by more than a few months. Perhaps, they would have arrived at a solution different from those developed at Los Alamos; but whether their mechanism would have been (or, in fact, is) less or more efficient than ours, we do not know (unless this information has been provided by an American agent in the Soviet atomic project).

It has often been pointed out that the bottlenecks in the development of the atomic bomb project during the war have not been in the establishment of basic facts or the blueprinting of technical solutions, but in the actual construction of the large production plants. There is no reason to assume that the same was not true of the Soviet progress as well. This means that the speed of this progress probably was determined by factors on which spying had but little, if any, influence,

—except possibly, by inducing their earlier initiation.

The present relative strength in atomic armaments of the West and of the Soviet Union, and—even more so—the rate at which this strength can be increased in the future, is very likely to depend, mainly on other factors and not on whether the American head-start was three or five years, and not on whether the Soviet engineers have been able (with the help of spies or by their own ingenuity) to develop detonating mechanisms equalling or exceeding in efficiency those produced in America. Among these factors the most important may well be whether convenient supplies of raw materials for the production of nuclear explosives in the area dominated by the Soviet Union equal those available to American and British projects. From this point of view, the most fateful step, which has permitted the Soviet Union to achieve its present atomic strength, was not the betrayal of our secrets by May, Fuchs, and Greenglass, but the decision of American political and military leaders in 1945 to give to the Soviet Union control over the parts of Czechoslovakia and Germany in which important uranium ore deposits were known to exist. These regions had been reached by American troops first, and abandoned to the Soviet Union in accordance with the demarcation agreement. Perhaps, if the atomic bomb development in the United States had not been surrounded with such extreme secrecy, those responsible for the drawing of the demarcation line would have known better what they were giving away—or at least, would have been exposed to the advice of those who knew.

II. TOO LITTLE OR TOO MUCH SECRECY?

When the first stories of atomic espionage found their way into the press soon after Hiroshima, some scientists were inclined to discount them as propaganda spread by those interested in keeping the atomic energy project under military control. Other scientists—those who set out to look on the world with as much detachment as they could muster, in the hope of finding rational solutions to some of its troubles—could not fail to see that in a world divided into sovereign nations, with a war between every two of them at least a theoretical possibility, every nation was engaged in espionage against every other nation, whether friend or foe. (Not so long ago, Switzerland sentenced a man to a long prison term for wartime spying on behalf of the United States!) They could not doubt that after the elimination of Germany, the strongest incentive for spying was between the Soviet Union and America. The Soviet leaders, with their lifelong training in underground activities, obviously were well equipped for the organization of successful espionage; equally clear, a police state, such as these leaders established in Russia, had a much easier task protecting itself against espionage than countries whose people were free to move and to communicate with each other.

Scientists, more conscious than anybody else of the importance of scientific weapons, had no reasons to doubt that any military intelligence worth its pay would place the laboratories where these weapons were forged among its main objectives and would try recruiting scientists as operatives. Even if scientists were more immune to communist ideology than lawyers, doctors, writers, or other professional groups (it is now fashionable to believe that they are much less immune and to dig into the depths of the scientific mind to find reasons for this wickedness) the probability that not a single one among the many hundreds of scientists on the atom bomb project would be found ready to do the Soviet bidding was very small indeed.

It was therefore with considerable misgivings that many scientists listened in 1945 to the glorification of the security achievements of the Manhattan Project. The public understood little of nuclei and fission; but having suckled on comic strips and been weaned on detective stories, it was ready to admire the feats of those who claimed to have kept the two-billion-dollar and two-hundred-thousand-man undertaking in absolute secrecy—so secret, in fact, that even those who worked on it (with the exception of General Groves and a half-dozen of his top aides—so the favorite story went) did not know what they were doing.

As a matter of fact, every one on the Manhattan Project worth his doctor's diploma was fully aware of its aim and could make a pretty good estimate of how the project as a whole was getting ahead. Even scientists outside the Manhattan Project, noting the quantity and quality of scientific manpower swallowed by this project, could guess its aim and speculate that the steady growth of the undertaking must mean that the fulfillment of this aim was assured. The author of this article confesses that before joining the atomic bomb project, he guessed its purpose; and that this estimate was independent of any indiscretion by anybody "on the inside."

It was a source of astonishment to many scientists when it turned out, after the war in Europe ended, that Germans knew very little about the American progress. The only plausible explanation of why German spies had failed to note the disappearance from their laboratories of all the outstanding nuclear physicists in America, and, following their peregrinations, to discover the enormous construction programs going on at Oak Ridge and Hanford is that they were not told to look for this kind of thing, because the government agencies which directed them were, like the whole Nazi political system, totally "unscientific."

Our own intelligence, too, had not been very effective in finding out what was happening in the German atomic energy program during the war; but the reason for this failure might have been that, after an initial start, the German atomic energy project had petered out, so that in looking for something similar to the Manhattan Project, Allied intelligence was trying to find something that was not there. In any case, we hope that, at present, American intelligence is as alert as its Soviet counterpart to the fact that scientific and technical development have come to mean as much to military preparedness and planning as the formation of new divisions or changes in gun emplacements.

The lesson of the last ten years seems to be that, in a country of free travel and free communications, an alert and properly briefed group of observers cannot be prevented, in the long run, from discovering a scientific or technical development of the size of the atomic energy project and identifying its purpose. Furthermore, in a country where people are free to read and to write and to associate with others of like mind, it is unlikely that any political, religious, or social philosophy, however wayward or dangerous to society, will not find some converts. If the adherents of such ideologies take timely care to avoid ostentation and formal commitment, they are not likely to be spotted by routine "loyalty checks." Consequently, a group of the size assembled during the war in the Manhattan Project (or in the many present undertakings of the Atomic Energy Commission) can be expected to contain, despite all screening by routine clearance procedures,

at least a sprinkling of undesirable individuals of every kind.

THE DISILLUSIONMENT

When magazine articles glorified the success with which the atomic bomb project had been protected by the security organs of the Manhattan Project, the more skeptical scientists kept their fingers crossed and hoped for a minor miracle. We had almost come to believe it when the first disillusionment came in 1948 with the revelation of May's activities. Two years later, the arrest of Fuchs proved that the Manhattan Project security had been a myth. It has been suggested that if members of the European team had been subject to American clearance procedures (instead of our accepting their clearance by the British) the break would not have occurred; but let us not forget that the American spy, Greenglass, had no difficulty in gaining admission to the innermost sanctum of the Manhattan Project, the very building in which parts of the first atomic bombs were designed and machined.

Greenglass was a mechanic, not a scientist. No case of disloyalty has yet become known among American scientists associated with the Manhattan Project—including the European scholars settled in America, who in 1941 had initiated the atomic bomb development in America. The satisfaction over this record should be tempered with humility. The chance of a communist agent having been—or still being—present among American atomic scientists, natural-born or naturalized, may be relatively small—but it is not necessarily zero. We must still keep our fingers crossed.

All known cases of betrayal of atomic secrets have occurred under military administration. Since the civilian Atomic Energy Commission took over in 1947 and the FBI assumed the responsibility for personnel clearance, not a single case of betrayal of secret information has been made known to the public. The fact that the security record of the civilian commission is so much better than that of the military wartime administration is a source of satisfaction for those who fought for civilian control of atomic energy. Nevertheless, the AEC should hesitate to take pride in this record before the Soviet archives are opened to historians. The American atomic energy program simply is too big to be wrapped securely in an airtight cloak of secrecy.

Looking backward, it seems doubtful whether America has gained anything at all from the immense effort and expense it had invested in keeping the entire wartime atomic bomb development secret. Even if the development of atomic weapons had been carried on in the open, it seems unlikely that Germany could have matched or disrupted it. Japan would have been unable to forestall, except by early surrender, the atomic strikes at Hiroshima and Nagasaki—even if they had been publicly announced. In retrospect, we see that the great secret has deceived only ourselves. After Hiroshima, the belief in the great atomic secret created a false sense of security, contributing to the fateful withdrawal from Europe and the general disintegration of American armed might.

Perhaps if the development of atomic energy had been surrounded with no such all-embracing secrecy, and strict secrecy had been limited to the most important technical developments (such as the construction of the implosion bomb), no technician with doubtful family relations, such as Greenglass, and no physicist with such unknown antecedents as Klaus Fuchs would have gained access to the closely circumscribed area of secrecy.

THE FUTURE

Subsequent to the Manhattan Project, with its peak of 200 thousand workers, the Atomic Energy Commission, with its steady employment of 100,000, is attempting to keep out of all its enterprises every potential "security risk," and to preserve in the "classified" category a large range of research and technical progress. More and more government agencies join the AEC in a quest for 100 per cent security. American security agencies are thus forced to dissipate their efforts upon a steadily widening field. The FBI has to investigate everybody from day laborer to the director of a nationally known industrial concern, if he is to take even a minor part in the atomic enterprise, and the same applies to many other government agencies and private establishments. Since we are not living in a totalitarian state, where one-third of the population (including minors) spies on the other two-thirds and the secret police can easily follow every step of a citizen, a routine loyalty investigation can merely reduce the probability of penetration into a large project of a person who is disloyal or unreliable, but cannot eliminate it altogether. The FBI has often been reported as over-burdened with investigation of innumerable people, most of whom will never have access to any classified information (not to mention information which is really worth keeping secret) and has asked to be relieved of it in order to be able to concentrate on guarding the really important areas; but the tendency of Congress and public opinion is steadily to add new groups to the ones already subject to investigation.

The extension of secrecy and loyalty investigations over vast regions of science, technology, and public service undoubtedly slows down and demoralizes our research progress and, indirectly, also our national mobilization effort. There is grave doubt whether attempts to further lengthen and thicken the secrecy walls will lead to anything but more damage to our progress—and new self-deception.

The choice seems to be between converting America into a Soviet-style police state with restriction on everybody's freedom of employment, movement, and communication and admitting that a free country cannot successfully keep a large part of its national activities under a cloak of secrecy. If the latter alternative is accepted, the area of secrecy must be reduced, permitting a really effective control of those who have access to it.

Paraphrasing a familiar phrase, one is perhaps entitled to say that it is possible to keep a lot of things secret for a short time, or a few things secret for a long time, but not a lot of things secret for a long time.

III. THE LEGALITY OF THE SENTENCES

If the consequences of atomic espionage are reduced to realistic proportions, the question arises whether the sentences imposed on some of the members of the spy ring are in agreement with the American concept of impartial justice.

One of the fundamental differences between the totalitarian states, as evolved in Russia by Lenin (and imitated in Germany and Italy by Hitler and Mussolini), and the democratic society is their attitude toward law. The totalitarian concept of law is that of a handy and flexible instrument, to be used in the interest of the state and not binding on the state itself. Crime, in the Soviet Union and other totalitarian systems, is whatever runs contrary to the interests of the state, as interpreted by its rulers. The judiciary, in these systems, is an organ of the political administration. The definitions of crime, as given in the statutes, are for them but examples provided for guidance of the judiciary in

routine cases. The legal procedures, described in the Soviet constitution and Soviet laws, can be (and often are) cast aside when other mechanisms of imposing penalties—from secret disposition by the security police to public show trials—appear to suit the state better. The penalties provided in the law for certain crimes can be increased or lowered in dependence on the origin or social status of the accused and the importance attached by the state to his punishment under the momentary political or economic circumstances. Nobody in the Soviet state can be certain at any given moment whether a certain action (or, inaction) of his own will make him a criminal, and if so, what penalty he may face.

In the democratic concept, laws are norms which apply to all citizens equally and at all times and are binding on the state. The courts that administer criminal laws are bound by the legal definitions of the crime and of the penalty it carries; each citizen is supposed to know, or to be in a position to know, what these are. Under certain conditions, the courts are free to reduce the penalty below the maximum provided in the law because of considerations such as the personal history of the accused; never can they exceed it, however heinous or despicable the crime or however damaging it is to the society.

Often, strict adherence to legal procedures and definitions offends the feelings of people as to what is just and unjust. Courts may be forced in consequence of loopholes in the law, to let a criminal, of whose guilt the public has no doubt, go free or to penalize the righteous. Even in countries with a long tradition of respect for the law, public opinion has little understanding for such conflicts between law and justice and often clamors for the law to be overruled or at least changed in a hurry. And yet, history proves that the nearest approach to freedom and justice in a society is achieved when objective and stable laws are maintained supreme and inviolate in conflict with momentary passions of the people and necessities of the state.

THE EXCEPTIONS

Nothing in human institutions is absolute. Under conditions of extreme danger, every state has the right to defend itself, even if this defense may require temporary relaxation of strict legality or a wider interpretation of the law than would have been permissible under ordinary conditions. In times of war or insurrection, many sentences are pronounced and carried out by military and even by civilian tribunals whose avowed or thinly veiled purpose is to impress a group rather than to mete out justice to the individual.

However, if we want to preserve the very foundations of the democratic legality which we wish to defend against totalitarian arbitrariness, we should oppose temptations to accept the methods and principles of a war tribunal (which are also the methods and principles of justice in totalitarian states) in any situation except a real and extreme emergency. In the interests of American leadership in the free world, we must lean backwards in maintaining equality before the law, even for the enemies of freedom, unless forced to make exception by acute danger to national security.

The ease with which laws are broken and necessities of state invoked by totalitarian regimes must make us more watchful than ever for a similar tendency developing in our midst. Bad political customs, like bad money, have the tendency to drive out good ones. In our memory, methods of warfare which have horrified democratic nations when first introduced by their enemies, such as aerial bombardment of cities or sinking of passenger ships without warning, have been taken over and perfected on a vast scale by America and its democratic allies.

Similarly, administrative procedures of totalitarian countries have the tendency to spread into free countries. There is no doubting that even in absence of open war, the threat of totalitarianism makes certain adjustments in the practice of free countries necessary and that those who oppose or undermine free institutions in the service of totalitarianism cannot claim equal protection with those who defend or abide by them. However, we have but to recall the deportation and internment of Americans of Japanese ancestry from the West Coast after Pearl Harbor to realize how unjustified the excuse of acute danger to national security, which seemed fully convincing to the majority of population at a certain moment, may turn out to have been when looked upon in sober retrospect.

The public belief in the tremendous damage inflicted on our security by atomic espionage and the possibility of catastrophic consequences of repetition of this crime may explain why the two death sentences imposed in the spy trials have met with general approval in the press and public opinion and why little concern has been expressed over the interpretation of the treason law which was required to make these penalties possible. A courageous column by Dorothy Thompson was one of the very few public comments critical of the decision. If it were not for the public feeling—shared by the judge—that extreme penalty was needed to deal with an extreme danger, at least two legal aspects of the decision would undoubtedly have caused some comment.

THE INTERPRETATION

One of them is the application of the clause which provides penalty of death for espionage "in time of war" to the activities of the Soviet spy ring during the war with Germany. Rightly or wrongly, those who wrote the law did not consider espionage as deserving death penalty except during a war. The prosecution argued—and the court agreed—that the clause "in time of war" was formulated deliberately without any reference to whether the power in whose favor espionage had been committed was the one with which America was at war. In other words it held the death penalty to be applicable also for spying in time of war on behalf of a nation which is an ally in this war.

It is undoubtedly true that, according to the laws of all nations, betrayal of military secrets is a crime even if it is made to a friendly nation. No spy can claim immunity because he has acted on behalf of an ally (an excuse claimed by May, Wadeligh, and several other "idealists" who conveyed secret information to the Soviet Union during the war). There is, however, a difference between saying that the status of a nation as an ally does not warrant *impunity* of its agents and the application to the agents of this nation of exceptionally severe provisions for wartime spying. The common sense interpretation seems to the writer to be that the enhanced penalty was provided by the law for spying *on behalf of an enemy* in time of war and that the words "on behalf of the enemy" were omitted because the meaning of the clause seemed self-evident.

It can be argued, of course, that the Soviet Union never has been a true ally of the United States, that it has been a partner in Germany's aggression against Poland, and that this partnership has been broken only be-

(*Continued on page 157*)

"SOVIET ATOMIC ESPIONAGE"

The *Bulletin* in the past has avoided dwelling on the "cloak and dagger" aspects of atomic energy. It has reported only briefly the facts of Soviet espionage, as revealed by the Canadian investigation and by the arrest and trial of Klaus Fuchs in England; and, except for Dr. Condon's case, has taken no notice of the unproven or inconclusive accusations of disloyalty directed against many scientists since 1945.

The public has been getting more than its fill of these kinds of stories from other sources. Since the day of Hiroshima, scientists have been concerned—and recent events have not diminished their concern—lest the secrecy features of the atomic weapons should obscure in the public mind their more important aspects.

The danger of a suicidal atomic war, which could not be postponed for long by America keeping atomic secrets inviolate (and which, once arisen, was bound to grow more and more menacing with time), and other lasting implications of science and technology in a world without unity and without law, made the *Bulletin's* central task clear: to bring into focus these fundamental long-range problems, only vaguely perceived by most people, and easily obscured by the exciting events of the daily atomic "cops and robbers" game.

The deep impression created by the atomic spy trials[1] in New York causes the *Bulletin* to break this tradition. Below we present a summary with excerpts of 222 pages of testimony, pertinent factual background, interpretation, and conjecture, issued after these trials by the congressional Joint Committee on Atomic Energy.[2] Elsewhere in this issue, some reflections on the trials are presented in an article by E. Rabinowitch. In the near future, we plan a special issue devoted to the problems of science and loyalty in its many facets.

[1] For a summary of the trials see pages 125–26 of the April *Bulletin*.

[2] *Soviet Atomic Espionage*. Prepared by Joint Committee on Atomic Energy. Washington: U. S. Government Printing Office, April 1951.

A SYNOPSIS OF THE KNOWN FACTS

(*a*) *Klaus Fuchs*

Dr. Fuchs was a member of the British atomic energy mission which came to the United States during World War II in accordance with the 1943 Quebec agreement between President Roosevelt, Prime Minister Churchill of the United Kingdom, and Prime Minister King of Canada. The British certified to the Manhattan Engineer District, which then had responsibility for American atomic development, that Fuchs could be trusted; and this certification was accepted without further inquiry.

During 1944 Fuchs lived in New York and worked at Columbia University, participating intimately in efforts to develop the gaseous diffusion U-235 separation process—a process now embodied in the K-25-27-29-31 plant complex at Oak Ridge, Tennessee, and to be embodied in the major new plant complex under construction at Paducah, Ky. It is little appreciated that Fuchs is not only the betrayer of weapons data but also the great betrayer of the theory underlying the only U-235 production method in use today.

In August 1944 Fuchs moved to Los Alamos and worked there until June 1946. He took part in the making of the earliest atomic bombs; he was privy to ideas and plans for improved atomic weapons, and he possessed insight into the thinking of the period as regards the hydrogen bomb. Fuchs returned to England in mid-1946 and soon became chief of the Theoretical Physics Division at Harwell, Britain's principal atomic research laboratory.

Some three years later American security authorities advised Britain of a lead developed in the United States, and this brought about Fuchs' arrest, conviction, and imprisonment in early 1950. He had shipped to Russia the most sensitive information, including extensive quantitative data in written form, regarding the Oak Ridge gaseous diffusion process, the weapons work at Los Alamos, British activities at Harwell, and other projects located in the United States, Canada, and the United Kingdom.

(*b*) *Bruno Pontecorvo*

The reactor of most advanced design and performance operating in North America is the Canadian NRX heavy-water pile at Chalk River, Ontario, and Dr. Pontecorvo contributed to the nuclear aspects of this device. In addition, he had knowledge of nuclear problems involved in building the plutonium-production piles at Hanford, Wash. Pontecorvo is considered by some of his scientific associates to be more outstanding as a physicist than Klaus Fuchs.

An Italian by birth, Pontecorvo studied at Rome and Paris and, when Nazi Germany invaded France in 1940, escaped through Spain to the United States. For a time he was employed by an American oil firm, and then, in early 1943, he joined the Anglo-Canadian atomic energy team at McGill University, Montreal. The next year he moved to Chalk River, Ontario, and—during the same year—engaged in classified discussions at the Chicago Metallurgical Laboratory. Later the main emphasis in Pontecorvo's efforts shifted from reactors to cosmic-ray research, although he continued to enjoy access to secret atomic energy data. Also his more recent studies included work upon tritium, a substance intimately related to the hydrogen bomb. Pontecorvo remained at Chalk River through 1948, the year in which he was naturalized as a British citizen. Thereupon he became a senior principal scientific officer at the Harwell Laboratory in England. Pontecorvo, his wife, and three children disappeared behind the Soviet iron curtain, fleeing via Sweden and Finland, during September 1950.

Nothing has been said officially about Pontecorvo's participation in spying activity, but circumstances of his flight make this participation very

likely. While Pontecorvo had no direct contact with weapons work, it is possible to speculate that he may have betrayed reactor data from 1943 onward—supplementing the bomb details and the U-235 processing information divulged by Fuchs and thereby furnishing the Soviet Union with a particularly well-rounded picture of the Anglo-Canadian-American atomic energy work.

(c) Allan Nunn May

Shortly before World War II ended, Dr. May, a natural-born British scientist, met a Russian military officer in Montreal, Canada, and gave him laboratory samples of U-235 and U-233. This dramatic betrayal attracted wide attention in the press when May was arrested in early 1946, but still more helpful to Russia, no doubt, was the information which he also compromised. He worked closely with the wartime Metallurgical Laboratory at Chicago and he understood a number of the problems overcome in constructing the Hanford, Wash., plutonium piles. May, in addition, was familiar with the Canadian wartime atomic energy effort; and he knew miscellaneous facts about Oak Ridge, Tennessee, and Los Alamos, New Mexico. He confessed to writing an over-all report on atomic energy as known to him and transmitting it to the Soviets.

A nuclear physicist of considerable ability, May joined the British atomic project during the Spring of 1942. He worked first at the Cavendish Laboratory, Cambridge, England, and then, in January 1943, joined the Anglo-Canadian research team at McGill University, Montreal. In Canada he became a senior member of the nuclear physics division and remained until September 1945. Thereafter, until his arrest in February 1946, May was a lecturer on physics at Kings College, London. Upon returning to London, May did not come to the appointed meeting with the Soviet agent. According to his testimony, he was unhappy and wanted to terminate the unfortunate affair. Chances for international control of atomic energy, he thought, were good, and his earlier motives in giving information to Soviet Russia did not apply any more. He was 34 years old when arrested; he had been a Communist since before the war. May was sentenced on May 1, 1946, and is now serving a 10-year sentence in Wakefield Prison, Yorkshire, England.

Igor Guzenko, a cipher clerk at the Soviet Embassy in Ottawa, Canada, helped bring about May's arrest when he defected to the Canadian authorities in late 1945, taking with him papers which led to the exposure of widespread Soviet espionage activity in Canada. The Canadian spy ring is primarily associated, in many minds, with the divulging of atomic secrets; but Allan Nunn May is the only member of the ring who gave information in this category.

(d) David Greenglass

Of the four betrayers who themselves had access to secret atomic information, only David Greenglass is American-born; only he is an American citizen; and he is the only nonscientist in the group.

According to his own testimony in open court, Greenglass was assigned to the Los Alamos weapons laboratory in the summer of 1944 and there worked as a machinist upon high-explosive lens molds (an important component of the atomic bomb mechanism). He gave Harry Gold (who was a courier for Fuchs also) sketches and detailed written descriptions of this work, as well as a list of scientific personnel associated with Los Alamos and a further list of Los Alamos individuals who he thought might be willing to serve as Russian agents.

Greenglass grew up on the lower East Side of New York City, attending the Brooklyn Polytechnic Institute and Pratt Institute. In 1938, at the age of 16, he joined the Young Communist League. At Los Alamos, as an army technical sergeant, he eventually became foreman of a machine shop concerned with preparing weapon apparatus. Greenglass' testimony indicates that he was able to secure information far beyond the scope of his assigned duties.

He was arrested in June 1950 as the result of information supplied by Harry Gold and others, and he pleaded guilty to the charges against him. Although his espionage activities had terminated by 1946, when he left the army, his case is significant because Greenglass was in a position to furnish Soviet agents with mechanical details of bomb gadgetry and weaponeering that might have supplemented the data divulged by a theoretical physicist such as Klaus Fuchs.

(e) Harry Gold, and other contact men

Since the American population, according to official estimates, still contains several tens of thousands of Communists, it is not surprising that Soviet agents found means of conveying atomic secrets from Los Alamos, N. Mex., to their own consulate in New York City—once they had induced Fuchs and Greenglass, who worked behind the guarded Los Alamos gates, to provide these secrets in the first instance. The contact men, the couriers, the go-betweens, the spy recruiters, and Soviet officials in New York—such individuals have played a lesser role than a Fuchs or a Greenglass, though an indispensable one from the Soviet viewpoint.

(1) Harry Gold, a Soviet contact man since 1935, met Fuchs in Boston, New York, Santa Fe, and elsewhere and received both oral information and packets of papers for delivery to Russian officials. In addition, Gold served in the same capacity for Greenglass—and also for others who transmitted data having no relation to atomic energy. Arrested in May 1950, after Fuchs gave FBI agents his description,[3] Gold pleaded guilty and was sentenced to 30 years' imprisonment.

(2) Julius Rosenberg and his wife, Ethel, were convicted on March 29, 1951, in New York City, of conspiring with Gold and others to procure national defense secrets for Russia. This couple engaged in widespread espionage activities, although none relate directly to atomic energy except as they focus through Greenglass, who is Ethel Rosenberg's brother. Greenglass testified that the Rosenbergs induced him to betray Los Alamos secrets.

(3) Ruth Greenglass, wife of David Greenglass, was named as a co-conspirator in the indictment against the Rosenbergs, but has not herself been prosecuted. She testified to having conveyed to her husband a message from the Rosenbergs suggesting that he should betray Los Alamos information.

(4) Anatoli Yakovlev. Born 1911. A Soviet vice consul in New York. From 1944 to 1946 he supervised Harry Gold, receiving from the latter written and oral information furnished by Fuchs, Greenglass, and others. Left America on December 26, 1946, immediately after learning from Gold about the latter's association with Brothman and accusing Gold of compromising the whole espionage net-

[3] A vivid account of the hunt for Gold was given by FBI Director J. E. Hoover in *Reader's Digest*, May 1951.

work by associating with a man who, according to Yakovlev, was on the suspect list of American intelligence.

(5) Semen Semenov. An official of the Amtorg Trading Corp., Soviet purchasing agency with American headquarters in New York City, Semenov directed Harry Gold's activities as an espionage courier from 1940 to 1944, when Yakovlev took over.

(6) Other individuals connected or allegedly connected with the same espionage network include Abraham Brothman and Miriam Moskowitz, convicted of persuading Harry Gold to give false testimony before a grand jury; Alfred Dean Slack, a chemist, convicted of conveying to Gold secrets concerning a new type explosive; Morton Sobell, accused of betraying radar and electronics data; and William Perl, an expert on aerodynamics, charged with perjury.[4]

FAILURE OF BRITISH COUNTER-INTELLIGENCE?

The fact that Fuchs, May, and Pontecorvo were or became British subjects and entered the American-British-Canadian wartime project under the sponsorship of the British government has been the basis of much criticism directed at British security inquiries from both sides of the Atlantic.

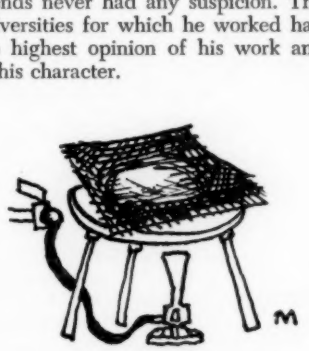
Pontecorvo, himself, appeared to have no visible ties to communism and displayed no particular interest in politics. Certain members of his family became prominent in the Communist party in postwar Italy, but this was not learned until 1949, at which time Pontecorvo was leaving the Harwell Atomic Energy Establishment for non-secret work at Liverpool University "anyhow." However, the fact was known to British authorities before his announced visit to his communist relatives in Italy, a trip which terminated eventually in Russia. Nevertheless, the British government, according to a statement by Mr. Strauss, the Minister of Supply, in the House of Commons, felt (in contrast to the established practice of the U.S. government), that "as he was the holder of a British passport there was no means of retaining him in the country."

Allan Nunn May was a pre-war member of the Communist party in Britain but apparently managed to conceal this fact.[5]

The question of the British authorities' knowledge of Fuchs' connections with Communists is left unclear in the congressional report:

On March 6, 1950, Mr. Attlee said in the House of Commons:

"I want to say one word about a matter which has caused a good deal of writing in the press, and that is the Fuchs case. . . . There is a great deal of loose talk in the press suggesting inefficiency on the part of the security services. I entirely deny that. Not long after this man came into this country —that was in 1933—it was said that he was a Communist. The source of that information was the Gestapo. At that time the Gestapo accused everybody of being a Communist. When the matter was looked into there was no support for it whatever. And from that time onward there was [still] no support. A proper watch was kept at intervals. He was a brilliant scientist. He was taken on in 1941 for special work by the ministry of aircraft production. He was transferred to the department of scientific and industrial research. He went to America. He came back to Harwell. On all those occasions, all the proper inquiries were made and there was nothing to be brought against him. His intimate friends never had any suspicion. The universities for which he worked had the highest opinion of his work and of his character.



In the autumn of last year information came from the United States suggesting there had been some leakage while the British mission, of which Fuchs was a member, was in the United States. This information did not point to any individual. The security services got to work with great energy and were, as the House knows, successful. I take full responsibility for the efficiency of the security services and I am satisfied that, unless we had here the kind of secret police they have in totalitarian countries and employed their methods, which are reprobated rightly by everyone in this country, there was no means by which we could have found out about this man."

Harry Gold, in the Rosenberg trial, testified concerning his September 1945 meeting with Fuchs as follows:

"Fuchs was very worried about one matter: This concerned the fact that the British had gotten to Kiel, Germany . . . ahead of the Russians, and Fuchs was very much concerned over whether the British Intelligence might not discover the Gestapo dossier upon him. I told Yakovlev that Fuchs had said that he had been the leader of the German student group at the University of Kiel and had fought the Nazi storm troopers in the streets of Kiel. Fuchs had said that there was a very complete dossier by the Gestapo upon him and he was greatly troubled by the fact that should the British Intelligence come upon it, they would become aware of his very strong communist background and ties."

On the other hand, Rebecca West[6] wrote: (on the basis of what information we do not know) "When war broke out between Great Britain and Germany, the aliens tribunal, before which he appeared to show cause why he should not be interned, accepted his membership in the Communist party as proof that he was anti-Nazi."

Kurt Singer,[7] another British writer, stated: "Although it was known that he was communistically inclined, so high was his qualification that he was allowed into the most secret consultations. Security officers, after careful screening, had reported that there was no danger he would become a foreign agent. Amazingly enough, although it was on record at the Home Office that he was a member of the German Communist party, a year after being released from internment, Klaus Fuchs was naturalized as a Briton."

GORDON DEAN'S COMMENTS ON FUCHS CASE

In the course of an interview following the conviction of Fuchs, Gordon Dean, Chairman of the USAEC, had the following to say:

Q. How long does it take to clear an individual?

[4] For denying under oath all acquaintance with the convicted members of the ring. Excerpts from the comment of the congressional report end here. Hereafter, comment is that of the *Bulletin*.

[5] Paraphrase of the committee report. No mention of May having admitted prewar Communist affiliations appears in the brief public report on his trial.

[6] *New York Times*, Magazine Section, March 4, 1951.

[7] *The Sign*, August 1950.

Dean. The average today is 53 days.

Q. And also the money that it costs to do the clearing?

Dean. The cost is between $100 and $200 per person, and if you clear thousands of people for projects, that's a lot of money—and time.

We are taking, I might add, a very hard look now. As a matter of fact, we've just had a long session on what we might recommend to change the act, with the objective both of keeping secret those things which we should keep secret and at the same time getting on with the job. I think that probably by the time Congress comes back we will have some constructive suggestions to make as to how it can be done.

Q. What percentage of the people you examine fail to get clearance?

A. Very small. My guess is that it is less than half of 1 per cent.

Q. Would you say that the arrangement or the setup you have with other governments for obtaining information from us is now satisfactory?

A. Do you mean, can we trust the certifications of other governments?

Q. Well, that is another way of asking it. The Fuchs case arose out of the fact that we didn't have it. Is the present arrangement satisfactory?

A. I think the present arrangement is generally satisfactory. We did have conferences, you know, with the British and the Canadian security officers immediately after this thing. They came over here and we had a 3-day session, largely to determine the comparability of our security standards, and I think it is reasonably safe.

Q. You don't feel so apprehensive of losing out in that direction?

A. No, although in the most perfect system, there may be some one who will slip through.

Q. To what extent did the British have access to our atomic information? I believe we were supposed to be partners with them in the original development of atomic energy?

A. During the war, it was a complete partnership. The British decided to give up trying on the gaseous-diffusion work and they came over to this country, and we had a complete partnership. As a matter of fact, there were about thirty, I believe, in the military mission from Britain who went to Los Alamos. They knew everything. They helped us very much in the development of the weapon. Since the war, we have operated under an understanding with the British and the Canadians in several areas which are not weapons areas. We have exchanged some visits within those areas, but that is the extent of it.

Q. In weapons there is now no real exchange?

A. No.

Q. Has the Fuchs episode had any effect on those scientists who were inclined for a long time to pooh-pooh the need for security—American scientists who were a little bit annoyed and irritated by our desire to have security because they thought it was inconceivable that Russia could do what she has done?

A. I wouldn't limit it to scientists. I would say that the Fuchs episode has had a sobering effect upon everybody connected with the program.

Q. In that way it was a blessing in disguise?

A. I think so. Some good came from it. It certainly doesn't equal the bad, but some good did come from it.

Q. Have you any idea what is wrong with human beings or with our system in these democracies of ours that these people will do the things that Fuchs did? Does the scientist have less regard for loyalty to his country than other people? Is he a world citizen who wants to give everything away? What is the reason that Fuchs got into this thing?

A. I don't think that you can say that scientists are an entirely different breed in that respect. . . . Fuchs is the type of man who, while he might have been caught had there been a real security check on him, might never be caught by any kind of investigation, because apparently he owes his allegiance to nothing that ordinary humans owe theirs to. He is going to make his own decisions regardless of any rules he purports to operate under.

What do you do with a man like that? Usually he is a very intelligent man. He is an independent man. He is an idealist of some kind. He might be a Communist-idealist, but he is a man of ideals of some kind. You don't usually spot this type in a check.

Q. Was he an inventive type, or was he just a theoretician?

A. I would say the inventive type—he was a very bright man. [Ed.—Theoreticians take note.]

GREENGLASS' STORY

Several bold analyses of Fuchs' personality and his motivations have been made by British writers and these have received much attention in this country. The lengthy testimony of David Greenglass in the report will tempt the reader to try a tyro hand at a similar analysis of this seemingly simpler personality. The greater interest which might attach to the Rosenbergs who were sentenced to death is thwarted by the lack of published testimony from them.

Money appears not to have been a decisive factor in Greenglass' resolve to spy although he received money for his espionage in amounts of some importance to him. Greenglass was brought to a sympathetic view of Soviet Russia in discussions with the Rosenbergs during the late thirties:

Question.[8] When did they begin, so far as the defendant Julius Rosenberg was concerned?

Greenglass. About 1937.

Q. All right. Can you remember any specific occasions on which they had these discussions with you?

Greenglass. Do you mean the early period or later?

Q. Start with the early period. Mr. Bloch[9] wants everything. Let me ask you this: In the early period how frequently would they express their views regarding the relative merits of the two countries?

A. I would say two or three times a week.

Q. Did the conversations run along the same line over a period of years?

A. Well, roughly, they did. The conversations on the merits of socialism over capitalism I think in the beginning were more vehement.

Q. Talking about socialism over capitalism, did they specifically talk about socialism as it existed in the Soviet Union and capitalism as it existed here?

A. They did.

Q. Which did they like better? Did they tell you?

A. They preferred socialism to capitalism.

The Court. What type of socialism?

A. Russian socialism.

★ ★ ★

The indoctrination bore fruit in a conversation between Greenglass and his wife during a visit of the latter to Albuquerque in November 1944:

Q. Will you tell us, Mr. Greenglass, what your wife said and what you said.

A. My wife said that while she was still in New York, Julius Rosenberg invited her to dinner at their house at 10 Monroe Street. She came to dinner and later on there was a con-

[8] By Mr. Cohn, counsel for U.S. government.

[9] Counsel for the defense.

versation between the three present, my wife, my sister, and my brother-in-law.

It went something like this: Ethel started the conversation by stating to Ruth that she must have noticed that she, Ethel, was no longer involved in Communist party activities—

That they don't buy the *Daily Worker* any more or attend meetings, club meetings. And the reason for this is that Julius has finally gotten to a point where he is doing what he wanted to do all along, which was that he was giving information to the Soviet Union.

And he then went on to tell Ruth that I was working on the atomic bomb project at Los Alamos, and that they would want me to give information to the Russians. My wife objected to this, but Ethel said—[Testimony interrupted by defense objections]

Greenglass (continuing). But they told her that I would want to know about it and I would want to help, and that at least—the least she could do was tell me about it. So that was the conversation. At first—she asked me what I thought about that—at first, I was frightened and worried about it and I told her—

Mr. E. H. Bloch. I object to his reactions or his state of mind.

The Court. Strike out his reactions.

Q. What did you tell your wife?

A. I told my wife that I wouldn't do it. And she had also told me that in the conversation Julius and Ethel had told her that Russia was an ally and as such deserved this information, and that she was not getting the information that was coming to her. So later on that night after this conversation, I thought about it, and the following morning I told my wife that I would give the information.

Q. Does that complete the conversation to the best of your memory that took place between you and your wife?

A. That's right. Then when I had told her what the conversation was—I mean, I told her I would do it, she asked me for specific things that Julius had asked her to find out from me.

Q. You mean specific information about the Manhattan Project?

A. That's right.

Q. Would you tell us, as you recall it, what your wife asked you?

A. She asked me to tell her about the general lay-out of the Los Alamos Atomic Project, the buildings, number of people, and stuff like that; also scientists that worked there, and that was the first information I gave her.

Q. In giving to your wife the names of the scientists working at Los Alamos on that occasion, can you now recall any of the names which you furnished to her?

A. I gave her Oppenheimer's name. I gave her Bohr's name, and Kistiakowski's name.

Q. Did you tell her about this Bohr-Baker situation?[10]

A. I did.

Q. You say you gave her a general description of the lay-out at Los Alamos, is that right?

A. That's right.

Q. How about the number of people there, the personnel, did you give any estimate of figures on that?

A. I gave her an estimate of how many people there were in the technical area.

★ ★ ★

Matters of greater probable interest to the Soviet spy ring were disclosed later when the courier, Gold, visited Greenglass and the latter gave the former a sketch of a lens mold used to implode the detonating charge in one type of atomic bomb:

Greenglass: I gave him a list of scientists who worked on the project. I gave him some sketches of flat type lens molds, and I gave him some possible recruits.

Q. What kind of recruits?

A. For Soviet espionage.

★ ★ ★

While Greenglass was sufficiently devoted to the Soviet cause to commit espionage with full realization (he testified) of the possible penalties under the Espionage Act, he was not ready to give up residence in New York City to extend his usefulness:

Q. Did you have any conversation with Rosenberg about how long you were going to remain in the United States Army at Los Alamos?

A. Oh, I just stated that as soon as I could possibly get out, I was going to go out of the army, get a discharge.

[10] Niels Bohr was referred to at the Manhattan Project as Mr. Baker; Enrico Fermi as Mr. Farmer; other prominent scientists also had pseudonyms.

Q. What did he say?

A. He said he'd want me to stay up in Los Alamos if I could get a job up there as a civilian, stay there as a civilian.

Q. Did he tell you why he wanted you to stay there?

A. Well, he said that he wanted me to stay there so I could continue to give information.

Q. What did you say?

A. I said I would like to leave the place, I would like to come home.

Q. After you were discharged from the army at the end of February 1946, where did you go?

A. I went back to New York City.

★ ★ ★

Nor was Greenglass willing to make the effort to continue his education even in New York and with a Soviet scholarship:

Q. Did any of these conversations (with Rosenberg after the war) relate to espionage activities?

A. They did.

Q. Would you tell us those conversations which you recall?

A. Well, in '46 or '47 Julius Rosenberg made an offer to me to have the Russians pay for part of my schooling and the GI Bill of Rights to pay for the other part, and that I should go to college for the purpose of cultivating the friendships of people that I had known at Los Alamos and also to acquire new friendships with people who were in the field of research that are in those colleges, like physics and nuclear energy.

Q. Did he mention any particular institutions which he desired to have you attend?

A. Well, he would have wanted me to go to Chicago, University of Chicago, because there were people there that I had known at Los Alamos, and it was a well-known institution, and it was doing a lot of good work in the field of nuclear physics.

Q. Did he mention any other institutions?

A. MIT and then later on when NYU had a nuclear engineering course he wanted me to take that.

Q. Did he give you the names of any scientists with whom he desired you to build up friendships?

A. No; he told me that at Chicago University there were some people that I had gone to school with, I mean, I had been at Los Alamos with, and that I should cultivate their friendships.

Q. Did he specify how much of

this money would be furnished by the Russians?

A. He specified that the GI Bill of Rights would pay for my schooling and they would give a certain amount of money for living of the student, and he said the Russians would pay additional money so I could live more comfortably.

Q. Now, did you ever agree to go to any of these schools?

A. I said I would try, but I never bothered.

Q. You never, in fact, did go; is that right?

A. That's right.

Q. Now, did Rosenberg tell you anything about activities of this kind in which he had engaged?

A. Well, he had told me that he had people going to schools in various places.

★ ★ ★

When the reader-analyst reaches the testimony which discloses that Greenglass, with $6,000 in his pocket and a complete set of seemingly feasible instructions for reaching the new Canaan via Czechoslovakia, nevertheless stays on in New York City until arrested (June 15), he will likely conclude that Greenglass was a complete simpleton. Actually, Greenglass was ready to emigrate soon after Gold's arrest (May 23, 1950), which Rosenberg correctly predicted would lead eventually to the arrest of himself and Greenglass. A nightmare sequence of delays, however—Rosenberg's procrastination in furnishing money and instructions, a serious kitchen accident suffered by Mrs. Greenglass, and the birth of a new baby—brought Greenglass to Memorial Day in May 1950, when, in getting passport photos for use in Mexico, he noticed for the first time that he was being followed. On June 2 or 3, he told that to Rosenberg, and when the latter asked, "What are you going to do now?" he answered, "I am not going to do anything. I am going to stay right here." And he did. He readily told his story after his arrest two weeks later, and said in court that he was "remorseful and contrite." At the end of Greenglass' testimony, it was disclosed that he was color blind. Perhaps, he had been blind to more than physical colors.

While the story of Greenglass, the American machinist, has been spread out in great detail in the open transcript of the New York trial, the politically much more important and perhaps psychologically more interesting histories and motives of the two scientist-spies, May and Fuchs, have been only vaguely indicated in the brief records of their trials before British courts (not to speak of Pontecorvo, who has never been questioned at all). This left it to publicists, novelists, and psychologists, to fill out the picture with plausible guesses and more or less penetrating dissection of the character and motives of these intellectual traitors. The possible relation of their disloyal activity to abstract scientific training and intellectual arrogance has, in particular, been a favorite subject of comment. This is a topic of supreme importance to scientists, and the *Bulletin* must return to a searching examination of it.

—T. H. D.

Tugwell: The Consequences of Korea

(*Continued from page 138*)

before the eyes of men. If we are to keep the blight of the atomic bomb from the earth and the people, we must be the architects of new instruments of government; we must seek peace through law."

But about Justice Douglas' plea there were only too many who were cold—cold because they could see no progress toward the goal Chancellor Hutchins and his colleagues at the University of Chicago had a few years before defined.[2] Indeed, Mr. Milton Mayer spoke for the discouraged many when he said bitterly that the world government movement would disintegrate as the war movement accelerated. The end is in sight, he said, "War will come faster than world government . . . and at the end of the war there will be a bit of charcoal to constitutionalize."[3]

There remained the United Nations, not by any means a world government, but at least a world forum; and it still functioned. But the internationally minded were still conscious that interested spectators, watching the building operations on First Avenue in New York, still often inquired of workmen there whether they expected to finish in time for the final dissolution. Mr. Mayer had proved to be right so far; hopes for world organization had been smothered by war and the preparation for war.

But this very fact underlined the contemporary dangers more effectively than anything else could have done. There was very little dissent to the proposition that technologically, the world was by way of becoming one. There was very general assent to certain of the consequences of this proposition—such, for instance, as the necessity for bringing underdeveloped areas up to levels at which their envy of more favored areas would not constitute a revolutionary threat. But the central consequence of oneness—that a single system of governance was required—appeared altogether beyond immediate reach. Men's imaginations were so warped and stifled by impending uncertainties that they very generally despaired even of maintaining the forum at the United Nations. They were, in other words, becoming reconciled to the postponing of world organization until another war had ended. And taxed with the paradox that if such a war occurred, there would be nothing to organize, they said frankly but hopelessly that they knew that very well.

Leading people out of such a despairing dilemma would seem to be the first duty of public leadership. There were two stages involved in the American course of action: the first to arrive at a negotiable situation; the second to find the compromises necessary to success in negotiation. The question in 1951 was whether the attainment of the first—momentum of rearming—was not being allowed to make the second—a working play for negotiation—impossible. But if it did, and we went on into war rather than negotiation, we went to a destruction which no statesmanship could repair.

No one would expect crisis negotiations to result in world government. But those who believed that the crisis would not really be past until some world institutions had been accepted, would still be thankful for some working compromises. These might stave off disaster while sense and time got in their work. If negotiations substituted themselves for war because war was now recognized to both great contestants as an impossible recourse, and if accommodations should be recognized as an absolute necessity, the further logic of its gradual institutionalization might take hold and grow in people's minds. That was the hope in 1951 as war was the overwhelming fear.

[2] In a *Constitution for a World Government*, Chicago: University of Chicago Press, 1949.

[3] *Common Cause*, III (May 1950), 518–25.

Book Review

"WE OF NAGASAKI"

The following review of a recent book by Dr. Takashi Nagai was written by Michael Amrine, author of "Secret." In addition to Mr. Amrine's review, we present portions of two chapters of the book.

THIS book, in form very much like John Hersey's *Hiroshima*, is actually not a duplication but explores another dimension in understanding what atomic bombing is actually like. What did the bomb do to the minds of the survivors?

"The experts," Mr. Nagai says, "have shown cities demolished and fields laid waste; they have talked about genetic effects and about radiation sickness. But very little has been said about *people* in an atomic war, *as people*. They are going to flee their cities. They are going to dig into hillsides and hole up in mountain caves like beasts. They are going to go mad of fear without surcease."

We of Nagasaki was assembled by writing down the spoken stories of survivors in one little neighborhood in Nagasaki. Some survivors were grade-school children whose wide-eyed wonder adds not only a refinement of horror but an overwhelming clarity and realism to the account.

Of the psychological after-effects of the bombing, Mr. Nagai's ten-year-old son said, "From that time to the end of the war, everybody seemed to be going crazy. Even when there weren't any planes or anything, some people were very nervous and running around all the time, and some were scared and wouldn't budge out of their shelters. Some people . . . would get angry for no reason. Some didn't do things they should have, like their job and so on; and some did lots of senseless things they needn't have. There were some people that were always dropping things from nervousness and some couldn't remember anything—names and numbers and things like that. Many people had one eye on the sky all the time—they couldn't pay any attention to what they were doing, and they hardly heard when you spoke. Life got all mixed up."

Dr. Nagai was a radiologist at the Nagasaki Medical College, and was already suffering from radiation-induced leukemia* before the bomb ever exploded, and so he has made a particularly good editor. Through both professional and personal knowledge he is able to write an account matching Hersey's as an historic document, a book which must not be missed by any person striving to understand our age.

This is the first Japanese account of the bombing to be published in the Western world—a fact which seems more odd the more one reflects on it. It is the first English account by anyone who knew the bombed area and its people before and after. And most importantly, it is the first to show appreciation and give a record of the psychological and social damage which Dr. Nagai convincingly demonstrates is more horrible and more irreparable than the physical damage.

Three related traits of the American mind (and to a lesser degree, any human mind) have created a kind of woolly curtain, resisting equally well the rapier wit and the emotional bludgeoning applied in "atomic age education." Scientists and civil defense planners can try to penetrate mass consciousness with the grim facts of modern man's peril, but their "hard facts" bounce back from this cotton curtain, just as the sharpest sword is baffled by a pillow.

In seeking to make men appreciate that "the atomic bomb means such a difference in size that it amounts to a difference in kind" scientists' personal and professional educational efforts have run into the fact that even "college-educated" Americans have not the training in rigorous thinking which would enable them to take in that concept. John Smith thinks civilization survived World War I, and it survived World War II, and no doubt it will therefore survive any war or any weapon. One can't convey to him by ordinary educational means that the destructiveness of war is increasing *geometrically*, because he is not even prepared to interpret in human terms the *arithmetic* of millions of casualties, millions of destroyed homes, millions of prisoners, millions of "displaced persons" and refugees.

Besides this lack of equipment needed to appreciate the physical energies released in atomic warfare and their statistical effects, the individual American is also, like any other human being, unable to envision his own death; and it appears that collectively men in societies have the same inability. They cannot even really face the possibility of catastrophic damage, unless they have in the past suffered something approaching it in scale. Americans would be less in danger today if they had had more famines, massacres, and civil wars in their history!

But the real key to the "just another weapon" mentality is the third, and typically American trait—the faith in the happy ending, the trust in inevitable progress. So it is Dr. Nagai's documentation of the meaning of "irreparable damage" which makes his book so important. Some injuries to nations may be considered as wounds which heal and are forgotten—except perhaps for a little scar tissue which is chiefly of academic interest. Some, it would appear to survivors of Berlin and London, are amputations—with

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We of Nagasaki. New York: Duell, Sloan and Pearce, Inc., 1951. Pp. 189. $2.75.

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* As this issue goes to press, we learn that Dr. Nagai died on May 1 of leukemia.

the encouraging difference, in our body politic metaphor, that new legs or arms may actually grow again.

But some—and here Warsaw, Coventry, and Stalingrad might join with Nagasaki—might reasonably be compared to infusion of transmittable or hereditary diseases, which will continue to throw poisons into the social bloodstream unto the third and thirtieth generation. This without reference to radiation!

Most significantly, this radiologist is almost entirely preoccupied with the personal, psychic effects on individuals, leading to social disintegration. He says that all survivors are haunted by a sense of guilt, similar to the burdens which frequently break down survivors of combat. How guilty of me to live when my brothers and comrades are gone!

It will be an ironic and shattering but a wholesome experience for any scientist who has been conscious of guilt feelings over helping to make this weapon to read the other side of the coin; it seems to be all one coin, heads or tails.

Dr. Nagai appeals for further study of the social effects of atomic bombing, and implicitly his book is a rebuke to American social science and mental therapists—how typical of us to send military men, journalists, radiologists to the two dead cities, but only an unorganized scattering of students of the real "lingering" effects.

If his book should spark some real effort to understand, it would contribute to breaking up that apathy which keeps the American mind from facing the world which American technology so largely created. Dr. Nagai's final appeal is an eloquent thrust at the heart of our complacency:

"... In the nations of the world, scientists have studied the effects and the after-effects of the atom bomb. They have held experiments, analyzed the results ... what they have learned they have passed on to the councils of the generals and statesmen. And by this the conferences to free the world of atomic menace succeed or fail, and I understand they have failed; by this the decision to use or not to use the bomb is made, and I hear they do not regard it as so fearful, so unusable ... a city cannot be obliterated wholly ... it is just another weapon, with greater physical effects than those which preceded it.

"Greater physical effects! ... Do they understand, have they investigated what it does to the heart and conscience and mind of those who survive? Do they have any knowledge of our society of spiritual bankrupts, now striving lamely to function as a community?

"We of Nagasaki, who survive, cannot escape the heart-rending remorseful memories.... We carry deep in our hearts, every one of us, stubborn, unhealing wounds. When we are alone we brood upon them, and when we see our neighbors we are again reminded of them; theirs as well as ours.

"It is this spiritual wreckage, which the visitor to Nagasaki's wastes does not see, that is indeed beyond repair."

Here truly is the tolling of a bell which all Americans must hear someday, one way or another, a bell which warns mankind that civilizations can die not merely through attrition or decadence, but through self-inflicted wounds which are "indeed beyond repair."

It might seem that civilization or culture only inhabits the body of a city as a soul may be a renter in the body of a man. Culture is the collective memory of the race, it is not physical homes, books, statues, or temples.

But it seems to be more complicated than that. Dead cities, like dead men, breed diseases which live after them. One can bury a man, but one has to rebuild a city. And it does not seem that collective memory recovers from the psychic shock when it tenants a new (or half-new) body.

We of Nagasaki tells us of America that it is not always possible for men to choose what to remember and what to forget.

—Michael Amrine

CHAPTER X
Cracks and Fissures

After the first atom bomb had been detonated in New Mexico, photographs of the blast center were released. One of these showed that the ground beneath where the bomb went off had actually fused from the heat to a sheet of glass, in which, upon cooling, cracks and fissures appeared....

The bomb that struck Nagasaki on August 9, 1945, was Atom Bomb Number Three. The fissures which then appeared throughout the blast center have not yet disappeared, four years after. I am not talking about cracks in the ground. I am talking about the invisible chasms which appeared in the personal relationships of the survivors of that atomic wasteland. These rents in the ties of friendship and love have not closed up with the passage of time; on the contrary, they seem to be getting wider and deeper. They are cracks and fissures in the mutual esteem of fellow citizens and in their friendship for one another. They are no more than tiny bits of suspicion and distrust. Yet, of all the damage the atom bomb did in Nagasaki, they are by far the cruelest....

We ... who went through the bombing, did not at the time have the slightest conception of an atom bomb. ... Although I was directly under the atomic cloud, it did not occur to me that it was such an extraordinary thing—I thought it was just a huge aerial mine or something like that. But as the cloud spread and thinned out, once again letting through the light, which had been completely blocked, and it became bright enough to see again, I felt, as I looked around, "The end of the world is here!"....

"The atom bomb must not be used again!"

This cry was once almost universal among the peoples of the world, but, with the passage of time the intensity of their conviction has fallen off....

The world had two ugly scars—Hiroshima and Nagasaki. We thought of these as anti-war vaccinations. But, when two or three years had passed, it began to appear that the immunity against war that such vaccinations should have provided was decreasing. The nations of the world have conferred repeatedly and continue to confer on the question of control of atomic energy, but differences of opinion appear impossible to iron out....

Today, four years after that day, here in Nagasaki ... houses are being rebuilt ... we have enough clothing, quilts, and blankets ... our bellies are full enough—there are fewer mouths to feed, and much land that had been covered with ashes and rubble has been converted into vegetable gardens....

Our expressions are brighter, and we appear to be living happily among our neighbors....

Still, in the personal bonds among the inhabitants of our city, the invisible cracks have appeared.

... There was the time Mr. Tanaka found Satoru's brother Masaru in need of succor, and made no move to help him. Of course, in the circumstances, Tanaka was not to blame.... Satoru has never once uttered a word of complaint or reproach. Yet the silent gulf lies deep between them. It will not heal for a long time to come, if ever.

And what about Satoru himself? Did he not stay down in the air-raid shelter and forget all about his mother and sister and brothers? . . . Of course, he was just a grade-school boy and he had sustained an injury to his head, so surely it was perfectly natural that it should not occur to him to try and save them. Nonetheless, Satoru has lost faith in himself. . . .

Sadako Moriyama too lives in constant torment. . . . When her brother Shigeharu came back from Timor, she was unable to look him in the eye when she told him of their parents' last moments. As for Shigeharu, he cannot abide the thought of her inaction, even assuming that their parents were already past saving. He and Sadako never make mention of this—but between brother and sister a gulf now exists.

. . . When she had come to her senses and poked her head outside the shelter, Sadako saw four children lying just outside; yet she did not go to help them, for she assumed they were dead. . . . It was only because Ritsuko wanted water that she discovered the children were still alive.

Not that she has ever had to listen to a word of reproach from the children; they died soon after. Nor had Mr. Fujita ever blamed her. Yet to this day, whenever she runs into him on the street she feels a sharp pain in her breast. . . .

Then there is Tatsue. Right before her eyes had been the burning town with her mother somewhere inside, but she made no attempt to dash through the fire and save her. . . . When her younger brother Masaichi came back alive from Saipan and asked for his mother, Tatsue could only hang her head and then collapse in tears; and she is still in constant fear that one day he may ask her to tell him in detail just what happened. And whenever Masaichi thinks of their mother burning to death, he flies into a rage, and she must listen meekly. So here again is a crack between a brother and a sister, made by the atom bomb. . . .

. . . . Immediately after the bomb went off, those who were not disabled fell into two classes: one, the people who stayed right where they were; the other, those who took instant flight. Those who stayed on the spot to help stricken friends or to save their home or the office or factory where they worked, were promptly enveloped in the flames along with whomever or whatever they had hoped to save. Right behind the college hospital the ground rises into a hill, so those of us who stayed where we were, were able to take refuge up the hill when the fire began to close in on us. That was how . . . I happened to escape alive. But people in the heart of town, if they tarried the briefest instant, lost whatever chance they might have had to escape; and those who did take flight met quick death if they dared stop to help anyone on the way.

In general, then, those who survived the atom bomb were the people who ignored their friends crying out *in extremis;* or who shook off wounded neighbors who clung to them, pleading to be saved; or who left behind records and files . . . for which they were officially responsible. . . . In short, those who survived the bomb were, if not merely lucky, in a greater or lesser degree selfish, self-centered, guided by instinct and not civilization . . . and we know it, we who have survived. Knowing it is a dull ache without surcease. . . .

I was an officer of the College First Aid and Rescue Committee, and I was so conscious of my position, so concerned about doing what I felt was expected of me *as* an officer of the Rescue Committee that it was over two full days before I got to my home, where my wife lay dead. I discharged my responsibility. What will be my reward in the eyes of Makoto and Kayano when they are grown? . . .

The next morning, from the hill of the college, I saw the ruins of my home. Urakami was a blanket of white ashes. At first I was unable to locate my house, but, using the Yamazato Elementary School as a landmark and figuring from the stone steps of the school building, I was finally able to make out the stone wall near where my house had been. In the bright morning light not a thing moved, anywhere. The very thought left me weak all over. I was no good for work all day. I just stayed in the shelter. It was but a half-mile to the ruined house, so it would have been possible for me to go there, even if only for a few moments. Of course, I had lost blood and absorbed radiation, but if I had been burning with love toward my family and my neighbors, I would have managed to get to them even if I had had to drag myself. My wife was already dead, as it happened, but in the air-raid shelter of the tonarigumi old Matsu Moriuchi, the Tagawa child, and others lay injured, waiting for a doctor. . . . They were waiting for *me.* "We needn't worry, Dr. Nagai belongs to our tonarigumi. We'll be well taken care of in an air raid"—that was what they had always used to say.

Ever since that day there has been a crack between me and the other members of the tonarigumi, although we never talk about it.

And why didn't I go to them on that morning? Simply because I was in fear of another bomb. The first one had taken us completely by surprise—our first inkling had been those brilliant flashes in the sky. Any instant now there might be another great flash overhead. I was shaking with fear: that was what made me unable even to set foot outside the shelter. That was why I couldn't get up the nerve to cut across the shelterless wastes to the ruins of my house. . . .

This quality of desperate fear will typify people in an atomic war. With atom bombs, there is no relaxation, even for a second. We were paralyzed by constant dread. Human activities stopped dead.

Fortunately, the war ended shortly after our experience. If it had continued, we would all have gone mad from ceaseless anxiety.

We of Nagasaki, who survive. . . . know what only one atom bomb can do to plunge decent people into a pit of sorrow.

CHAPTER IV

Fujie Urata Matsumoto's Story

Fujie Urata, who tells this story, was about thirty-five at the time of the bombing. She was a first cousin of Midori Nagai, Dr. Nagai's wife.

I was pulling up weeds in the rows of millet on the hillside at Koba, at a place three and a half miles from Urakami; Mount Kawabira stands in be-

tween. In Urakami we were neighbors of Dr. Nagai's, and if I had been home at the time I certainly would have died. My old mother, Take Urata, who had stayed home to watch the house, was burned to death.

Suddenly I heard a loud roar overhead. It sounded as though a plane had just dropped its bombs and was flying away.

Here it comes, I thought.

There was a sudden flash of red light.

Then a flash of blue.

The red was bright enough to stun a person, but the blue!—it was so bright that not even the worst liar could have found the words to describe it.

That was all. There was a wind which blew away the weeds I had pulled up, but nothing else happened.[1]

What could these flashes be? . . .

I scanned the sky. Rising higher than high Kawabira, in the sky over Urakami, a puffy black smoke began boiling up and up, filling that whole part of the sky. Kawabira seemed to divide the world in two, one part looking normal as ever and the other strange and terrible. I couldn't attend to my work. I sat down at the edge of the field. It was almost noon, so I ate some of the food I had brought. After about fifteen minutes a bawling, stark-naked child passed by along the road at the foot of the hill. He looked as though he had been swimming in the river and had had an accident.

Five minutes later a girl of about twenty came struggling along the road uphill from Urakami. Her clothes were in shreds and her hair in disorder. She seemed barely able to stay on her feet. I could hear her loud sobbing from where I sat on the side of the hill. Next a weeping schoolboy came along, his clothes in tatters also, and his face and hands black and swollen. I suddenly became anxious about my mother. I scrambled down the hillside and ran down the road toward Urakami.

As I came nearer to Urakami, I began to meet many injured people. They must have been workers from the arsenal,[2] young men and women, all of them naked, except that some still had their leather belts around their waists and on some the strings of their *mompe* still circled their ankles. They were stumbling along unsteadily, trying to escape behind Mount Kawabira, weeping crazily, forgetting even to be ashamed of their nakedness. Their faces, necks, and hands were blistered and on some of them I could see sheets of skin that had peeled right off and hung down flapping, all black with dust. The hair of the women was singed and frizzled. Many of these people had been wounded and were smeared with blood. . . .

When I finally reached Urakami, about two hours after the big flash, I found everything in flames. I managed to get to a spot overlooking the Yamazato Elementary School. From here I could see that my own part of town was completely gutted. Everywhere, smoke rose from the embers. I tried to find the path to my house but the ground was covered with hot ashes and, even if I had found it I couldn't have used it. . . .

[Next] morning the sky was clear. The cloud which had filled the sky over Urakami had drifted eastward. Somehow I felt a kind of hope; I had the feeling that it was over. I started out to look for my mother and sister.

Urakami was a hill of ashes. It had never been so hushed. It reminded me of the way deserts look in pictures, except that it was even more quiet than a desert. A desert is always bare of people, animals, and anything that grows but here, up to only yesterday, there had been houses and living creatures. In a single day these had disappeared.

In the ashes I could make out nothing moving or motionless. Up on one slope, the cathedral was completely in flames, sending up a great red blaze. How still and solemn the whole scene looked under the morning sun! This was the only fire still burning in ancient Urakami. All the others had gone out.

My mother's bones were among the ashes of our house. I found her at the mouth of the air-raid shelter under the floor, consumed to such a little heap of bones. She must have heard the explosion and rushed to the shelter, where she was crushed.

In the ruins of Ichitaro Yamada's house, next door to ours, I could see the bodies of four of five children alongside the body of an adult. Ichitaro himself had been drafted and was away in the army, and here was his family, wiped out. I would not want to see the look on his face when he came back. . . .

The pumpkin field in front of the house was blown clean. Nothing was left of the whole thick crop, except that in place of the pumpkins there was a woman's head. I looked at the face to see if I knew her. It was a woman of about forty. She must have been from another part of town—I had never seen her around here.

There was a big persimmon tree in the field, too big for one person to get his arms around. It had been snapped off at eye-level and blown through the air. From its position I guessed that the blast must have come from the direction of the Matsuyama section. Beside the stump lay the body of old lady Maruo. . . .

In the wreck of Reiko Urata's house nearby I could see a charred skeleton, sandwiched between the sink and the stove. Could it be Reiko's mother? I wondered.

Midori's bones were still in her kitchen, so I knew that Dr. Nagai had not come home yet. Because I knew that if he were alive he would want to bury her with his own hands, I let the bones lie where they were. Cousin Midori was the kind of person who is always full of energy. If she wasn't doing something she would get fidgety. But now she was at peace.

Across the way, in the ruins of Satoru Fukabori's house, were the remains of a large and a small skeleton. They would be Satoru's mother and baby brother. Next door was the wreck of Hatsuji Tagawa's house. Here too I could see charred bones. On the path between the Tanakas' and the Fukitanis' homes was a charred corpse. There were the remains of three skeletons in the ruins of Sadako Moriyama's house. In the garden behind the house, where he had been blown, Sadako's father, Suematsu, was sprawled on his face, dead. He had no external wounds, so he must have been slammed against the ground and his insides squashed. I took off some of my clothes and covered him up. This was no time to try and take care of the body. I went over to the shelter in the schoolyard and there I saw Ritsuko's mother, Shizuko. She looked far gone—already her breathing was uneven. . . .

When I told her that Ritsuko was alive, she felt at peace. . . .

I decided to go to the medical school and get Dr. Nagai. I started off for Yamazato-cho[3] but the ashes on the ground were still hot and I couldn't make any headway. There was nothing to do but return to the

[1] The blast and the radiation were blocked by the intervening mountain.

[2] The Mitsubishi Urakami Ordnance Plant.

[3] The suffix -cho means, approximately, "precinct."

shelter. I had been gone ten minutes; when I got back, Shizuko was dead.

Everybody was dead, everybody I had come looking for. . . .

There in the school yard Mr. Tagawa was burying two children. He told me they were Kimiyo, the Tsujimotos' little girl, and his own second boy, Toshibumi. Two of his children and old Auntie Matsu Moriuchi were alive in the shelter. They seemed to be the last survivors in the entire cho.

Enemy planes roared by overhead, one after another. I was tense, dreading still another great flash. I knew that there was supposed to be danger in an air raid only while the planes were directly overhead; if you were careful, you could avoid the bombs. But I didn't know when or where another big flash might come.

If a war like this lasted very long we would go out of our minds if we survived at all. I suddenly felt terrified. I could not stay here in Urakami a minute longer. I just left my mother's body and the bodies of so many of my relatives and scurried off to Koba.

Makoto and Kayano Nagai were waiting under the shaddock tree. "Where's Mummy?" Kayano asked.

The two children were now motherless—but there they were, still standing under the shaddock, waiting for their mother who would never return.

A relief team had set up an emergency sick-bay in the battered school building. We watched them moving people who had died during the night out into the yard, lining them up in rows. How could so many have died in one night?

Many of these bodies were unmarked. I heard that people who had not been wounded and seemed to be all right would begin feeling out of sorts and all of a sudden drop dead. It made me panicky. Here I was bustling around now, but I might suddenly go off myself. All there had been was one big flash, but whatever it was it still had a terrible curse on us. I felt that if I was going to have to live in such terror, I would rather have been killed instantly.

The people cremating the corpses were doing it at the risk of their lives. With planes flying overhead all the time, the smoke made them good targets. But by evening all the bodies had been attended to. They were just piles of bones now, young and old alike. It's a lucky family that lives and dies in the natural order—first the grandfather, then the father, then the son. . . . But generations didn't count any more in Urakami. . . .

NEWS AND NOTES

Prepared by PETER AXEL

MILITARY AND INDUSTRIAL USE OF FISSION PRODUCTS

Operation of atomic reactors, particularly large ones, such as those at Hanford, leads to the accumulation of large quantities of fission products. These are a mixture of radioactive isotopes, with different lifetimes, and different types of radiation. In contrast to the pure radioisotopes produced "to order" by irradiation of various materials in the nuclear reactor, which are in great demand by research institutions, the mixed fission elements until now, have been treated as useless and dangerous by-products. In fact, the British government has announced plans to dump them into the ocean, (in safe containers, of course). At the Hanford plutonium works, they have been stored in large underground tanks.

Two kinds of uses appear possible for the fission products: industrial and military. In both fields, some news was made recently.

INDUSTRIAL USES

The Stanford Research Institute issued on March 18, a booklet, *Industrial Utilization of Fission Products—A Prospectus for Management,* prepared under contract with the AEC reactor development division. The prospectus points out that fission products offer industry an opportunity to obtain cheaply strong sources of radioactivity.

The prospectus lists five properties of fission product materials that might be of interest to industry: their ability to kill micro-organisms, to induce chemical reactions, to ionize gases, to activate phosphors, and to produce rays which can penetrate solids.

The booklet also lists some of the uses these properties suggest, including the sterilization of foods and drugs in containers without heat, production of new or cheaper chemicals, production of improved eliminators of static electricity and of fluorescent lights, production of new types of luminescent paints and tiles, tracing of pipeline flows, and radiography. Some of these uses are speculative, others have already been technologically developed through the use of other radioactive materials.

The elements present in fission products are largely in the atomic weight range from 72 to 162. Some are common elements, such as iodine, cadmium, molybdenum, strontium, cesium, and other rare elements such as technetium and prometheum. Among the most abundant components of the mixture are the following ones:

Strontium 89: beta emitter, half-life 55 days;

Strontium 90: beta emitter, half-life 25 years; decays to yttrium 90, a beta emitter with half-life of 62 hours;

Yttrium 91: beta emitter, half-life 57 days;

Zirconium 95: beta and gamma emitter, half-life 65 days; decays to technetium 95, a beta and gamma emitter with half-life of 35 days;

Technetium 99: beta emitter, half-life one million years;

Ruthenium 103: beta and gamma emitter, half-life 41 days;

Ruthenium 106: beta emitter, half-life 1 year; decays to rheodium 106, a beta and gamma emitter with half-life of 30 seconds;

Cesium 137: beta emitter, half-life 33 years; decays to barium 137, a gamma emitter with half-life of 2.6 minutes;

Cerium 144: beta emitter, half-life 290 days; decays to praseodymium 144, a beta and gamma emitter with half-life of 17.5 minutes;

Prometheum 147: beta emitter, half-life 4.4 years.

This list illustrates one of the main difficulties of practical application of unseparated fission products: their lifetime range from seconds to thousands of years. For some technical uses, intensely radioactive, short-lived isotopes are desirable while long-lived ones are a nuisance or a danger; for other uses, the situation is reversed.

MILITARY USES

Existence of accumulated fission products is the main basis for speculations about a possible resort to "radiological warfare" (RW). Radiological weapons have been discussed in the *Bulletin* by Louis Ridenour, in an article based on calculations by the Austrian physicist, Hans Thirring.[1] The subject is reviewed in a recent issue of the U.S. Armed Forces magazine, *Officers' Call*.[2] We reprint here some passages from this article.

After reviewing the scientific background of radioactivity and fission, the article proceeds:

. . . 600 to 800 Roentgens absorbed in a short period of time would be a fatal dosage in all cases. Of people [who] absorbed 450 R in a short time, about half would die if no medical aid were given. A quick dosage of 200 R would make about half of the individuals so exposed ill. It is expected that none, or a very small percentage at most, would die. To cause immediate death by radiation, a really tremendous dose of several thousand R would probably be necessary.

Radioactive materials are most adaptable for RW when they—

1. are gamma emitters,
2. have a half-life not shorter than 1 week and not longer than 6 months,
3. can be laid down in concentrations sufficient to give anyone in the contaminated area a daily dose of from 10 to 100 R.

Pile irradiation permits the production of agents having the specific characteristics desired for RW purposes, but the irradiation process would cut down the output of plutonium. The alternative of making [specific] RW agents from the by-products of the atomic pile operation would involve a very costly process of separating the desired from unwanted by-products.

We have a stockpile of unseparated by-products, which thus far have been regarded as waste material. This mixture of more than a hundred fission products might be employed [in RW] without additional processing, except to remove unused uranium. [However], this mixture includes materials with very long, and others with very short half-lives. In an area contaminated by such a mixture, the total radiation would at first be very intense; but as the shorter-lived elements decayed, it would drop rapidly, because only the less active elements with the longer half-lives would remain. Some of these would continue their activity, although at low intensity, for many years or even centuries.

Several factors, military, technical, and political, argue against using an RW agent that includes these extremely long-lived materials. They would deny, or make unnecessarily hazardous and difficult, subsequent entry into the contaminated area. They would create grave postwar problems by making the contaminated areas uninhabitable for long periods. Another objection concerns the delivery of the agent on the target. To achieve a given amount of radioactivity, the volume of mixed fission products must be much larger than would be necessary if the agent consisted of specially selected, highly active material.

One aspect of the delivery problem, making compactness especially important, is the necessity for shielding the agent so that it will not injure persons handling it. The explosive in an artillery shell remains inert until it is readied for use by setting and arming the fuse mechanism. An RW agent, on the other hand, is in an active state from the moment it is produced. It must be 'packaged' or shielded with materials capable of stopping the radiations. Since the agent is likely to consist of gamma emitters, whose penetrating power is very high, a shield of considerable weight and thickness is required. The heavier this shielding must be, the more important it is that the agent itself has maximum compactness. After studying this problem at length, one scientist suggested laconically that the shielding, instead of the RW agent, be dropped on the enemy!

A related problem is that of heat. [In the shield] the energy of x-rays changes into heat, making the container very hot. A container holding enough radioactive materials to contaminate an area of moderate size might generate as much heat as the average home furnace.

Most kinds of military equipment can be stored indefinitely against some future need. A stockpile of RW agents is constantly depleting itself. Only by continually adding more materials to the stockpile can it be maintained at a given level. The materials most suitable for RW [those with short half-lives] present the greatest problem because of the faster rate at which they lose their radioactivity.

Because of decay, large RW stockpiles cannot be efficiently maintained for some indefinite but probable future need.

[A hypothetical RW operation is then discussed.]

[Let us assume that] for tactical and other reasons, the proposed operation requires an RW agent whose half-life is 30 days; [that] 1 pound, spread uniformly over 1 square mile, will produce an initial radiation of 50 R per day; [and that] its daily production is 10 pounds.

Problem: What is the maximum area that can be contaminated and how long will it take to assemble the necessary amount of material?

In theory, the greatest amount that can be accumulated is about 430 pounds—beyond that point the stockpile would be decaying as fast as we could replenish it at 10 pounds per day. In 70 days we can assemble 80 per cent, and in 140 days 96 per cent of the theoretical maximum.

After 140 days, we will have enough material to spread 1 pound per square mile over 430 square miles. The initial radiation will be 50 R per day, but will dwindle to 25 R per day on the 30th day. Persons who stayed in the area for 30 days would receive a total dosage of about 1070 R, whereas an exposure of at least 1500 R over that length of time is required for lethal effects. In order to achieve a 30 day total of 1500 R, the initial radiation will have to be about 71 R per day. To achieve this dosage, the concentration must be stepped up to about 1.4 pounds per square mile.

Thus the answer to our problem is: The largest area that can be covered [with a concentration which would be lethal in 30 days] is 310 square miles (430 divided by 1.4); to produce it will require 140 days.

During the first 30 days a lethal dose of 1500 R would be accumulated by anyone remaining in the area. Those entering on the 30th day and remaining until the 60th day would accumulate 750 R, a dangerous but not lethal dosage. From the 60th to

[1] *Bulletin*, VI (July 1950), 199–202, 224.

[2] Volume II, Number 6. Available from U.S. Government Printing Office, Washington 25, D.C.

the 90th day after the attack, 375 R would be absorbed, and people who had already accumulated 750 R previously would probably show signs of radiation sickness. The 375 R of the last 30-day period might cause illness in some people.

In the hypothetical operation just considered, the selected RW agent was one of considerable potency, yet we saw that it would not have caused immediate death to people in the target area. They could choose to avoid the accumulation of lethal or harmful doses by leaving the area within a day or so following the attack. The user of RW might conceivably achieve such vital military objectives as enemy evacuation of cities, bases, and airfields without killing people.

A further element of humaneness, and one of great importance regarding the victor's responsibilities toward the vanquished, arises from the fact that RW agents can temporarily deny the enemy the use of buildings and other objects in the contaminated area without damaging or destroying those objects. When the fighting has ended, people would not face the task of rebuilding blasted cities and homes. They would merely have to decontaminate them—and time itself does part of this job.

Now we consider some aspects of defense against radiological attack. The main defensive efforts would consist of detecting the radioactivity, keeping people away from dangerous amounts of it, and removing the radioactive materials from the area.

With the simple detection devices that would be available, troops in combat zones or civilians on the home front would have little difficulty *recognizing* an RW attack. In most cases, their next action would probably be to *move* from areas sufficiently contaminated to be dangerous.

It's important to remember that such movements could be made with comparative leisure in accordance with plans. There would be no cause for undue haste or hysteria.

An area affected by chemical agents is decontaminated by neutralizing those agents with other chemicals. Radioactivity, on the other hand, cannot be neutralized. Only the natural rate of decay can be relied on eventually to exhaust the activity.

The decontamination operations in RW [have as their purpose] the *removal* of the radioactive substance from the area. There are several ways of doing this. One is to scrape off the surface of the contaminated object. The sandblasting of ships' hulls following the Bikini tests was an example. Another method is to dissolve the contaminant with a liquid, perhaps an acid, so that it can be washed away. A third method is dependent on whether certain protective measures can be taken beforehand. Assuming sufficient advance warning, objects in the expected target area could be covered with a layer of plastic film. After the attack, this could be peeled off and removed.

Even a water film, formed by thoroughly drenching the structure before and during attack, would be partially effective in preventing the RW agent from attaching itself permanently to surfaces.

One alternative to removing the contaminant from an area would be to cover contaminated surfaces with something that serves as a shield. A contaminated road, for example, might be covered over with a thick layer of earth. This would permit people to use the road without undue hazard.

[In summing up the possibilities of radiological warfare, the article says:]

RW appears to have characteristics that could conceivably affect present-day concepts of tactics and strategy. The German invasion of Crete in World War II will serve to illustrate one way a defender could use RW.

For several days after German airborne and air-transported units attacked Crete, the British and Greek defenders restricted the Germans to one usable airhead. Eventually, however, the invaders were able to build up sufficient strength to break out of the airhead and overrun the island.

Now, suppose the Allies on Crete had been prepared to employ RW. By contaminating the German airhead they could have forced the enemy to withdraw those troops who had been exposed to radioactive rays for dangerously long periods. Thus, the Allies might have forced him to suspend his attack.

Another tactical possibility is the use of RW when an army wishes to break through a strong enemy line. By contaminating a selected enemy position, its defenders might be forced to evacuate. The attackers could then exploit the break immediately, since they would be passing through the affected area too rapidly to be harmed by the radioactivity. For this same reason, of course, a defending force cannot rely upon RW to protect its front—the attacking force can pass rapidly through a radioactive "belt" without undue risk of harmful exposure.

In the strategic sense, RW might be effectively directed against the enemy's war production and transportation centers. Without demolishing his factories, railroad yards, ports, and their adjacent living areas, the enemy could be made to evacuate these centers with military results comparable to the strategic bombing accomplishments of World War II.

Both tactically and strategically, RW would probably be most effective when used in conjunction with other forms of military action common to modern war. Radiological warfare is not the "absolute weapon" because these terms have no real meaning outside the pages of science-fiction of the more fantastic type.

The article cited above puts into proper perspective the suggestion by Representative Gore of Tennessee who, on April 16, urged President Truman to use "catacylsmic" (as he called them) atomic weapons to spread a belt of radioactivity across Korea. On April 17, Senator McMahon, chairman of the congressional Joint Committee on Atomic Energy, without referring specifically to Representative Gore's proposal, explained why plans of this type are impractical at the present time.

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PRIVATE PRODUCTION OF ISOTOPES

The Bendix Aviation Corporation of Detroit plans to make a privately financed feasibility study of a nuclear reactor to produce radioisotopes on a commercial basis. The AEC announced on April 4 that it was discussing this proposal with Bendix to see whether it fits into the commission's policies. The Oak Ridge reactor has had no difficulties in supplying all the isotope needs of the nation, and no complaints have been heard concerning the handling of the isotope distribution program by the AEC. However, the AEC probably is anxious to demonstrate that it is not hanging on to a government monopoly in one of the few branches of the atomic energy program in which private operation appears feasible.

SUPPORT OF RESEARCH

Of the 238 ten-minute-papers presented at the American Physical Society meeting in Washington April 26 to 28, 165 reported work supported in part or in full by government agencies; of these, 111 were supported at least in part by the AEC.

CALIFORNIA LOYALTY OATH

The University of California's special loyalty oath[3] was ruled unconstitutional on April 6 by the third District Court of Appeals in Sacramento. The unanimous decision of the court said, in part: "We conclude that the people of California intended, at least, that no one could be subjected, as a condition to holding office, to any test of political or religious belief other than his pledge to support the constitutions of his state and of the United States; that that pledge is the highest loyalty that can be demonstrated by any citizen, and that the exacting of any other test of loyalty would be antithetical to our fundamental concept of freedom. Any other conclusion would be to approve that which from the beginning of our government has been denounced as the most effective means by which one special brand of political or economic philosophy can entrench and perpetuate itself to the eventual exclusion of all others; the imposition of any more inclusive test would be the forerunner of tyranny and oppression."

The court ordered the re-hiring of the faculty members who have been dismissed because of refusal to sign the special oath and have instituted the court proceedings as a test case. If the decision is not reversed by the higher courts, it presumably means that those faculty members, who had left the university without awaiting the outcome of the appeal to courts, will be able to return to California. However, most, if not all of them, have accepted new positions at other schools and may be unwilling or unable to return.

As an example, following is the list of people previously with the Physics Department at California (Berkeley), who are not expected to be there next year. We do not imply that the departure of every one of them was a direct result of the oath controversy; but according to the chairman of the Physics Department, "in the entire history of the department, up to July 1950, only three members of the staff had been lost against the desires of the department."

G. C. Wick, presently at the Carnegie Institute of Technology in Pittsburgh;
E. Segré, University of Illinois;
R. Server, Columbia University, N.Y.;
W. Panofsky, Stanford University;
J. Steinberger, Columbia University;
G. Chew, University of Illinois;
W. Lewis, Institute for Advanced Study, Princeton;[4]
H. Wilcox, Inyokern, California (Air Force Experimental Station).

Several other departments, such as the Department of Psychology, have suffered equal or greater losses in eminent members.

Whatever the final outcome of the oath controversy, the University of California suffered irreparable loss in its research and teaching staff and in prestige and goodwill. It will be a hard fight back to its former position of preeminence. It hardly needs recalling that none of the dismissed faculty members was accused or suspected of communism or communist leanings.

AEC BUDGET

President Truman, on April 2, asked Congress for an additional 51.3 million dollars for "urgent production and research facilities" for the AEC. This sum was requested for this fiscal year and is independent of the 1210 million requested for next year. This addition will bring the total amount spent on atomic energy in this country to 8.75 billion; of this, the Manhattan district spent 2.2 billion dollars and the Atomic Energy Commission over 6.5 billion.

AEC SAFETY RECORD

Despite the continuous handling of dangerous radioactive materials, the AEC's injury rate for 1950—4.67 injuries for every million man-hours worked—was less than half the nationwide industrial average for 1949 (the latest year for which complete statistics are available). The Hanford plutonium production facilities, which have to deal with the greatest concentration of radioactivity in the world, reported the extremely low rate of 0.5 injuries per million man-hours. There were eight fatalities in the complete AEC plant, or 13.1 per one thundred thousand workers, as compared to a national average of 26.0. None of the fatalities were due to radiation. (The above figure probably did not include Dr. Eugene Gardner,[5] who died of beryllium poisoning in November 1950, after having been exposed in 1941–43, while working on the atomic bomb project.)

ATOMIC ENERGY COMMISSION EXPANSION

Four new operations of the AEC were announced late in March, but for security reasons, only a very general description was given. (1) A 45-million-dollar production plant will be built near Denver, Colorado. It will be operated by the Dow Chemical Company of Michigan and administered by the AEC's Santa Fe operations office, which is responsible for development, testing, and production of atomic weapons. The new plant will employ about a thousand people; it will handle radioactive material. (2) The Santa Fe operations office will also build a specialized research laboratory on a section of the National Bureau of Standards grounds south of Boulder, Colorado. The laboratory, under the direction of the Bureau of Standards, will have about 50 employees. (3) A 30-million-dollar uranium ore refinery and facilities for production of uranium feed materials will be built nineteen miles from Cincinnati, Ohio. (4) California Research and Development Company of San Francisco, a subsidiary of Standard Oil of California, will be contractor for a new development facility to be built on the site of the Weldon Spring Ordnance Works, Weldon Spring, Missouri.

FUTURE BOMB TESTS

That new bomb tests are to be held at the Eniwetok Proving Ground in the Pacific, was announced by the Atomic Energy Commission, March 20. They are being carried out by Joint Task Force Three, made up of Armed Services Personnel, AEC, and other civilian agencies of the government, under the command of Air Force Lt. General Quesada.

The revelation came in response to inquiries from the American Institute of Architects and indicated that it is intended to use these tests to obtain information on the effect of atomic bombs on different building materials and structures and that this information will be made available to the Civil Defense Administration.

Although the AEC refused to release any other information on the tests, the *Atomic Energy Newsletter*

[3] See article by G. Chew, *Bulletin*, VI (November 1950), 333.

[4] Professor Lewis is on leave from California as a result of the oath issue; however, he has not resigned from the department.

[5] *Bulletin*, VII (February 1951), 63.

reported that Representative Hebert of Louisiana, official observer for the House Armed Services Committee, will be away from Washington from May 1 to May 12. Senator Magnusson (Washington) announced in Tokyo on April 23 that he was leaving in a few days for Kwajalein to witness the tests.

SUMMER ACTIVITIES

A conference on Science in General Education to be held July 9–11, at Harvard University, will concern the relationship of science to society, philosophy, and history, and will feature addresses and discussions by distinguished educators and scientists from the United States, Europe, Canada, and Mexico. It will be open to the public and to summer school students.

North Carolina State College of Agriculture and Engineering at Raleigh, North Carolina, will conduct a graduate and undergraduate summer school in Nuclear Engineering for degree students and also for technicians and civilian defense personnel desiring short specialized training.

FOREIGN RADIO COMMENT

Radio Berlin, East Zone, repeated on April 8 that atomic research in U.S. is bankrupt and that such research has been suppressed by the U.S. government "because atomic plants destined for peaceful purposes are as inconceivable in an ultracapitalist country as a modern ocean-going ship steered by Vikings clad in animal skins."

QUOTES

David E. Lilienthal (former chairman of the AEC, in an article in *Collier's*, February 3):

"As a deterrent, the A-bomb has indeed been a great deterrent up to now. But our experience in Korea, and common sense, make it plain that the bomb has been over-valued in the popular mind as a guarantee of victory in case of war.... Korea jarred us free of the concept of the all-powerful, all-sufficient A-bomb. The one-shot security idea no longer commands the support of the country. Now, for the first time, the A-bomb may be seen in perspective. Our rearmament effort can proceed successfully only if we keep that kind of perspective; otherwise the mischievous 'magic formula' for victory, 'Drop an A-bomb,' will plague and distract the effort to strengthen and balance our military establishment.... We must buy security the costly way. There is no cheap way...."

Rabinowitch: Heretical Afterthoughts

(*Continued from page 142*)

cause of its betrayal by Hitler; that all through the period when the Western powers and Soviet Russia were fighting a common enemy, the Soviet Union only temporarily and superficially concealed her permanent hostility toward all non-Communist nations, and that therefore, even during this period, betraying of military secrets to the Soviet Union meant turning them over, not to an ally, but to a potential enemy. This evaluation may be correct, but has the American government the right to punish its citizens for having held different ideas at the time when its official policy was to treat the Soviet Union as true ally and to assist its war effort through lend-lease and other forms of military and economic aid? Was it not the official American representative in the Soviet Union, Ambassador Davies, who went out of his way—with official approval—to present the Soviet Union and its alliance with the West in the pinkest possible colors? This might have been the result of political naivete of the Roosevelt administration in respect to the Soviet system or a deliberate long-range political strategy (which has failed according to some, or was abandoned, according to others). In any case, it doesn't seem fair to incriminate American citizens either for having shared the illusions of their government or for having failed to recognize the difference between policies dictated by military and diplomatic necessities, and true belief in Soviet friendship.

This does not mean that spying on behalf of the Soviet Union during the last war was not a treasonable and despicable activity; but only that it seems a tenuous construction to apply to this crime the enhanced penalty provided by the law for the extreme and most amoral kind of such activities—spying on behalf of an enemy in war.

THE OTHER SENTENCES

The other aspect of the sentence that makes one uneasy is the comparison of the relatively mild sentences imposed on the actual betrayers of atomic secrets—May, Fuchs, Greenglass—with the harsher sentences given to the "middle-men" through whose hands this information passed on its way to the Soviet officials. Not only Fuchs under the British law, but Greenglass under the American law got away, the first with fourteen, the second with fifteen years of imprisonment. Gold, the second link through which the information passed, has been sentenced to thirty years while the two Rosenbergs received the penalty of death. The general impression is that the penalty has been in inverse relation to the readiness with which the members of the spy ring, once apprehended, have assisted the investigating authorities in the search for further members of the organization. The Rosenbergs were the only ones who refused to admit their guilt even in the face of overwhelming evidence, and it was this stubbornness that has brought them the extreme penalty.

Now it is common practice—at least in the American courts—that members of crime gangs who agree to turn state's evidence are promised and actually get a lighter punishment than their crimes would have brought upon them otherwise. As stated before, courts usually have the freedom to reduce the penalty below the normal level, in consideration of extenuating circumstances among which frank confession and readiness to assist the state is counted as one. It is something different, however, to see stubbornness in denying guilt and refusal to lead the investigation to further accomplices punished by an unusually severe sentence.

The treatment meted out by the Soviet power to all whom it considers its political enemies, the ruthlessness, terror, and suppression of all independent thought, the brazen way in which it uses the words "peace," "freedom," and "democracy" in the service of its expansionist aspirations make it natural that when American citizens are revealed to have put their loyalty to Communist dictatorship above their loyalty to their own free country and are brought to trial, no sympathy is lost on them, and people are ready to praise the most severe punishment imposed on them. Nevertheless, those who believe that the rule of law is endangered whenever the wicked does not enjoy the same impartial justice as the righteous are perturbed when the wicked is punished in a way which it seems to them does not quite fit the law, even if in the eyes of the people, it well fits the crime.

THE 403 million dollars requested by President Truman to provide for civil defense expenses for the remainder of the present fiscal year and for funds to match state contributions for the fiscal year 1952 was cut to $186,750,000 by the House Appropriations Committee in H.R. 3587, reported out to the House of Representatives April 6; of this amount 100 million dollars was limited to use only during a proclaimed state of emergency due to actual or anticipated attack, 75 million was set aside for shelter purposes, and five million was for a procurement fund to be reserved as working capital. This left a balance of $6,750,000 available to the administration for administration costs, procurement of equipment, and the other activities of the agency.

On April 30, the Senate Appropriations Committee further cut the request to a total of $84,000,000, including a complete striking off of funds for the shelter program and for the one hundred million dollar emergency fund.

The House explained its cuts as follows:

INTRODUCTION

The Civil Defense Administration rebuttal of the House arguments stated below are indicated by the footnotes in the text of the report.

. . . The problem facing the civil defense authorities and the Congress at the present time is one of concept. It would seem that the most urgent need is to educate the general public in matters of self-protection and to mold into one whole the individual efforts now being made by the states and municipalities.

The plans upon which the estimates submitted to the committee were based, appeared to be of a nebulous nature and to have been coordinated only slightly with the military forces of the nation.[1] For example, funds were requested for an attack warning system to be operated by civil defense personnel. At the present time there exists a wholly adequate and efficient civilian attack warning system in the air force, and the committee can see no need for the civil defense personnel to take over this work.[2]

It appears to the committee that one of the greatest protections to the civilian population under conditions of modern warfare is an effective radar system, and the committee suggests to the Department of Defense that every possible effort be made to expand the present system to its ultimate effectiveness and to make it as nearly perfect as possible.[3]

The present plans of the Civil Defense Administration contemplate fulfillment not in the present calendar year, but after 1951. The committee received testimony from leaders in the government which emphasized the point that the nation faces its greatest danger from enemy action during the present calendar year. In other words, even if vast sums were appropriated for civil defense they would be of no practical value since with the current planning of the Civil Defense Administration, they could not be effectively expended in time to meet the present emergency.[4]

In the face of these facts the committee feels that the best approach to the civil defense problem is to provide the various states and municipalities with a trained corps of personnel skilled in the various phases of civil defense, qualified to activate and administer a sound civil defense program when it is formulated by the federal government. This calls for the establishment of the necessary training schools by the federal government to train local leaders as well as to disseminate information and guidance to the states for the education of the general public.

The Civil Defense Administrator has recommended the establishment of one staff college and three technical training schools as quickly as possible. The committee believes that this recommendation is sound and therefore has approved the request for training and education in the amount of $787,000 [the amount requested]. It feels, however, that the present program does not place enough emphasis on the education of the general public, and, accordingly, has included in the bill an additional amount of $103,000 [not requested] for the training and education activity. This money should be used to educate the man on the streets in ways in which he can protect himself and his family from any disaster that might befall them as a result of enemy action.

COMMUNICATIONS

The basis for any defense of the civilian populace is a strong communication system, able to alert it to any possible danger, and to coordinate the activities of all agencies concerned in the event of an emergency.

The estimate received by the committee for the communication system was $5,660,000. Against this there is recommended an appropriation of $5,110,000 of which $110,000 is for 100 per cent federal contributions to the states and the remaining $5,000,000 for matching state contributions. The latter amount is included in the appropriation for federal contributions. The committee has allowed substantially the amount requested for communication equipment, which includes sirens, two-way radios, and larger type transmitters and receivers. It is of the opinion, however, that a more effective and less expensive program can be developed by a greater utilization of existing alerting equipment and by a retardation in the purchase of other communication equipment until the time that skilled personnel is available to handle it.

For example, the estimate as submitted includes two million dollars for the purchase of two thousand sirens. It would be most desirable to have a special type of siren for all civil defense alerts as is contemplated in the estimates. Certainly, however, there exists in every key center alert signals which can be coordinated with special sirens and utilized in lieu of a complete new system.[5]

Two-way radios for wardens and other such personnel are highly desirable. Information has been received, however, from the army signal corps

[1] Estimates were not nebulous but represented concretely how to start civilian defense and the money needed to do so, and were fully coordinated with the military.

[2] Not even the air force claims their warning system wholly adequate. The civil defense program would relieve them of responsibility which is theirs neither by statute nor propriety.

[3] Agreed that a radar system is needed, but such a system does not provide the public warning facilities needed.

[4] If we cannot complete the job during '51, then don't start! The same committee has appropriated funds for long-range military preparedness.

[5] If presently available warning systems are used, then they must be silenced with respect to their former purposes.

which discloses a shortage of this type of equipment in the military forces and indicates that any diversion of equipment to nonmilitary channels during the present calendar year would be to the detriment of the military services. At the present time there is a delay of 15 to 18 months in securing such equipment. Thus it would be difficult to obtain the material requested in the estimates during the fiscal year 1952. It is expected that production will reach a level in the fall of 1952 to enable all military and civilian defense needs to be supplied.[6] The large commercial-type transmitters and receivers contemplated by a 100 per cent federal payment are available with little delay.

EXECUTIVE DIRECTION

The executive direction activity is the administrative and operational program of the agency. Estimates were received for this activity in the amount of $1,515,000. The committee recommends an appropriation of $750,000. If proper plans are to be formulated and implemented, a competent staff must be available to the director. Each person selected for employment must be properly screened as to ability, and under Public Law 920 of the 81st Congress, a substantial number must be subjected to a loyalty examination. The committee is well aware of the fact that the departmental staff for the Civil Defense Administration must be highly skilled. It is obvious, however, that the organizational structure, as envisioned by the estimates, appears to be unrealistic and top-heavy. A more realistic approach to the organization of the departmental staff of the administration in Washington would result in substantial savings and in a more highly efficient organization.[7] The proposed change in the approach to our civil defense requirements calls for a much smaller staff than might have been required for an all-out but uncoordinated program.

PROTECTIVE FACILITIES

The availability of protective facilities is vital to the protection of the civilian populace in our key industrial and population centers. Such a program is by its very nature costly. With atomic bombing an ever present factor to be considered, the type of shelter needed has not yet been fully developed. Sufficient information is available to enable a start to be made on a survey of existing facilities and, where possible, to strengthen them to serve as shelter areas.[8] Unless proper control is maintained over the funds available for this work, there is nothing to prevent money being expended without desirable results and at an astronomical cost to the government. It is recommended that $75,000,000 [$250,000,000 asked] be appropriated to remain available until June 30, 1952. In this manner the program can be carried forward at a reasonable cost. When accurate standards for the construction of shelters are available, it can be implemented by additional appropriations. Up to the time of hearings no requests for cooperative

[6] Our information both from signal corps and management as of April 10 is that there is no shortage and that the military is not interested in placing orders.

[7] A smaller staff would be completely inadequate for the program envisioned.

[8] True, but no money has been appropriated by the committee to do the job.

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improvement of facilities had been received.[9]

PROCUREMENT FUND AND OTHER ACTIVITIES

The amount of five million dollars [twenty-five million asked] is recommended for the establishment of a working fund for the purchasing of organizational equipment, the fund to be reimbursed upon delivery of the equipment to the states. Through this medium, purchasing may be planned to conform to governmental economy and allocation plans. The reduction in the estimate for organizational equipment makes a greater working fund unnecessary.

Estimates were also received for other activities of the Civil Defense Administration, such as fire-fighting [$6,840,000 asked for pumpers, extra hose, etc.], warden services [$2,773,000 asked for items such as hand fire extinguishers, resuscitators, etc.], engineering services [$11,330,000 asked for portable water pipe and water purification equipment], transportation services [$1,500,000 asked for special fittings for converting ordinary vehicles to ambulances], medical services [$75,638,000 asked for surgical equipment, vaccines, serums, drugs, mobile laboratories, plasma, etc.], reserve supply operations [$2,058,000 asked for establishment of warehouses to store on-the-scene equipment], research and development [$3,875,000 asked for testing structures for blast effects, air sampling for biological warfare detection, etc.], and welfare services [$15,426,000 asked for cots and cooking utensils for mass housing and feeding. Not mentioned in house report, $500,000 asked for rescue service to obtain tools for releasing persons trapped in bombed debris. None of these amounts granted.]

The committee is rather amazed at the approach the Civil Defense Administration appears to be taking with reference to these activities. Instead of seeking to have the states and municipalities start their own programs, the position of the federal civil defense authorities appears to be that of having the states wait until the federal government can make contributions to allow them to go ahead with their programs. Such a position is diametrically opposed to the basic intent of the enabling legislation. The Civil Defense Act of 1951 envisions the federal government as a coordinating and guiding agency. Beyond that, primary responsibility for the implementation of the program rests with the states and municipalities. A more effective utilization of state and municipal resources both financial and otherwise must be made if the civil defense program in these fields is to be realized.[10] The activities contemplated by these estimates are contingent to a great degree upon long-range fulfillment. To that extent they can be deferred until more concrete plans can be formulated and until stronger programs can be developed by the individual states and municipalities.

The bill contains 100 million dollars [not requested by the administration] and the necessary language for an emergency fund to be available only in the event of a proclamation of a state of civil defense emergency. The federal Civil Defense Act of 1951 sets forth the conditions for such a proclamation. This appropriation becomes available to the administrator and the President immediately upon the issuance of such a proclamation based on an actual or anticipated enemy attack.[11]

REPLY OF MILLARD CALDWELL

The Civil Defense Administrator gave his answer to the committee's appropriation cut in a letter April 13, addressed to Governor Frank J. Lausche of Ohio for the Governors' Conference on Civil Defense. He said: There is little doubt that the House action will discourage some twenty-six state legislatures now in session in their efforts to provide for effective state civil defense programs.

The failure of the House Appropriations Committee to recognize the need for a well-organized United States civil defense program now presents a new challenge to the governors and mayors of the nation. They share with the Congress the responsibility for the safety of the people of this country. To whatever degree the Congress fails to provide the funds necessary for the program, the governors and mayors must carry an additional burden in the interest of national security and the safety of our people. The fact that the federal Civil Defense Administration may be rendered wholly ineffective by the withholding of necessary funds merely emphasizes the added responsibilities which are now on the shoulders of state governments.

The action of the House is undoubtedly due in large part to the general public apathy to civil defense. I must repeat to you what I have said earlier. The most vicious menace in America today is the shocking apathy of the American people to their danger from enemy attack. In the interest of our people and the free world, we cannot surrender to this apathy, despite what is done or not done by the Congress.

As the appropriation legislation now stands the agency can do practically nothing in these fields: fire-fighting service, warden service, engineering services, transportation services, rescue service, warning systems, reserve supply operation, organizational equipment, medical stockpiling, welfare services, and research and development. Unless funds are made available for the programs that have been eliminated, even the work of the staff college and the technical training schools will be unsatisfactory, since the essential knowledge and equipment in those fields will not be available for instruction. This means that the states and cities will have to do more of their own training and depend less on the federal government for guidance and information.

The House also approved 100 million dollars for use after an emergency is declared. Obviously, so far as our joint program of preparing the cities for attack is concerned, this was an idle gesture.

We can make no prediction as to the future of federal civil defense appropriation. This agency will do no lobbying with the Congress on the matter. The Congress must make the policy, appropriate the money, and take the responsibility for what happens if attack comes. If our funds are unduly limited, there will be a needless number of casualties and unnecessary slow-down in defense production if an attack occurs. The Congress must assume that risk. All we can do is express our views in the light of the staggering problems of civil defense which confront us at the federal and state levels. When the Congress completes its appropriation action, we will do what we can with whatever funds we have available.[12]

[9] The states have had to wait to see what funds were to be made available to them.

[10] The states have already appropriated $128,525,785 and $73,717,270 is pending. This statement, therefore, was based on conjecture rather than fact. Any federal lag will be reflected in state efforts.

[11] This is locking the barn door after the horse is stolen.

[12] Attached to the Caldwell letter is an analysis by the administration of the House Appropriations Committee report which includes the arguments in the footnotes.

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